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UNITED STATES DEPARTMENT OF AGRICULTURE

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Washington, D. C. ▼ June, 1926

# MARKETING WESTERN BOXED APPLES

By

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and

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Bureau of Agricultural Economics

CONTENTS

| | Page |
|---|---|
| Story of the Boxed Apple | 1 |
| Commercial Production | 2 |
| The Western Boxed-Apple Region | 3 |
| Harvesting | 9 |
| Inspection | 14 |
| Financing | 15 |
| Selling Methods | 16 |
| Transportation | 19 |
| Storage at Shipping Points | 21 |
| Using Cull Apples | 24 |
| The Market Season | 26 |
| Distribution of Boxed Apples | 29 |
| Sales in City Markets | 30 |
| Boxed Apples at Auction | 32 |
| Leading Boxed-Apple Markets | 33 |
| Features of City Markets | 34 |
| Market Preferences | 53 |
| Price Tendencies | 56 |
| Cost of Marketing | 60 |
| Cold-Storage Holdings | 63 |
| Market Supply Increasing | 64 |
| Increasing the Demand | 65 |
| Foreign Trade | 66 |
| Summary | 75 |
| Statistical Tables | 77 |
| Recent Federal Publications on the Marketing, Transportation and Storage of Boxed Apples | 94 |

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By GEORGE B. FISKE, *Investigator in Marketing Fruits and Vegetables* and RAYMOND R. PAILTHORP, *Marketing Specialist, Bureau of Agricultural Economics*

CONTENTS


| | Page | | Page |
|---|---|---|---|
| Story of the boxed apple | 1 | Leading boxed apple markets | 33 |
| Commercial production | 2 | Features of city markets | 34 |
| The western boxed apple region | 3 | Market preferences | 53 |
| Harvesting | 9 | Price tendencies | 56 |
| Inspection | 14 | Cost of marketing | 60 |
| Financing | 15 | Cold-storage holdings | 63 |
| Selling methods | 16 | Market supply increasing | 64 |
| Transportation | 19 | Increasing the demand | 65 |
| Storage at shipping points | 21 | Foreign trade | 66 |
| Using cull apples | 24 | Summary | 75 |
| The market season | 26 | Statistical tables | 77 |
| Distribution of boxed apples | 29 | Recent Federal publications on the marketing, transportation, and storage of boxed apples | 94 |
| Sales in city markets | 30 | | |
| Boxed apples at auction | 32 | | |


## STORY OF THE BOXED APPLE

The commercial prominence of the boxed apple dates back only about 20 years, although apple production began early in the development of the Northwest. Apple trees were bearing fruit at the Hudson Bay Co.'s post near Vancouver, Wash., as early as 1834. Apparently some trees were planted in Oregon, particularly in the Willamette Valley, within the next 10 years, and with the California gold rush of 1849 a rich market came into existence. Oregon apples sold in 1849 for $10 a bushel and 6,000 bushels sold in 1855 at $20 to $30. In fact, during the early years of the gold craze the price more than once went to $60 or $70 per bushel.

In California the initial attempts at apple production were less successful than in Oregon, but early in the nineties California had the larger apple production of the two States and slightly the greater number of trees, and claimed the largest individual orchard in the country.

Since then California and Oregon have remained about equal in number of bearing trees and in bushels of apples produced, while in

[1] The Divisions of Statistical and Historical Research, Agricultural Cooperation, and Cost of Marketing all of the Bureau of Agricultural Economics, have contributed material for this bulletin.

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Washington bearing trees have increased from one-fourth the number in either of these States in 1890 to two and one-half times as many in 1920. Idaho and Colorado have had a remarkable, though lesser, development. In all of these five States apple production has become a specialized and intensive industry. For the census year 1919 they had a total of less than one-sixth of the bearing apple trees of the country, yet produced nearly one-third of all our apples.

Whatever sustained increase has occurred in total production of apples during the past 30 years must be credited to the box region. Total production compared in Figure 1 by six-year periods from 1894 to 1923 shows heavy increases in the box region in each successive group of years and production for the last six years was nearly seven times that of the first period. Meanwhile total production in the barrel region had shown an irregular general tendency to decrease notwithstanding occasional very heavy crops.

APPLES: TOTAL PRODUCTION, BY REGIONS, AVERAGE OF SIX-YEAR PERIODS 1894–1899 TO 1918–1923

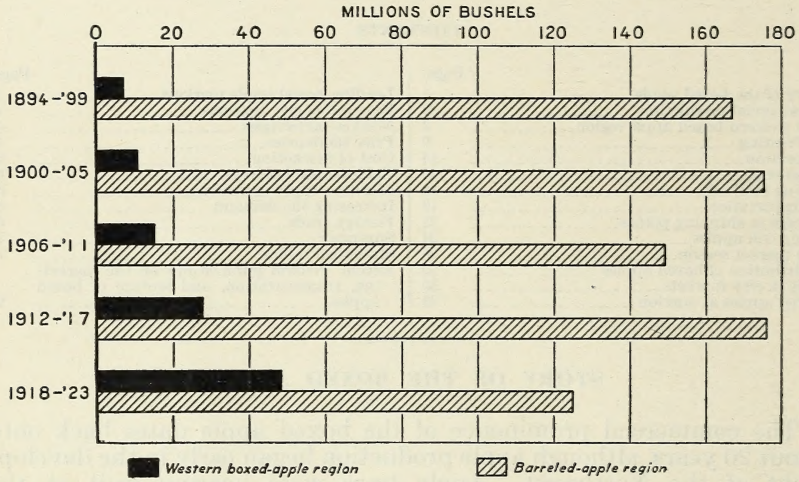


FIG. 1.—Production of western boxed apples has increased greatly. The average of 1918 to 1923 is 40,000,000 bushels over that of the first six-year period

## COMMERCIAL PRODUCTION

The boxed-apple region produced for commercial purposes nearly three-fourths as much as the barreled-apple region from 1918 to 1923. The commercial box crop ranged from 21 to nearly 50 million bushels in the six years and averaged 36 million, compared with 51 million in the barrel region. It exceeded the commercial barrel crop in 1921 and approached fairly close to it in 1919 and again in 1923. Washington surpassed New York in 1919 and again in 1921, 1922, and 1923, and has averaged more than half the boxed-apple production and about one-fourth of the combined boxed and barreled production. California's production has been remarkably regular with gradual increase. Its six-year average exceeded that of Oregon, and Idaho exceeded Colorado in average production. Utah and New Mexico are close contestants in sixth and seventh places.

One of the important features, from a marketing standpoint, is that the production in the box region has been heavier on the odd years, while the crop in the barrel region has been heavier in years of even date (fig. 2). Otherwise competition would have been even more severe.

Comparison of shipments over a 10-year period is impressive. In 1913 the car-lot movement, June to November, was equivalent to about 51,000 cars, of which 9,000 were from the western box region. In 1923 for the corresponding six months 101,127 cars were shipped, including 43,566 from the boxed-apple States. While eastern shipments had gained nearly two-fifths, the western boxed output had increased about five-fold.

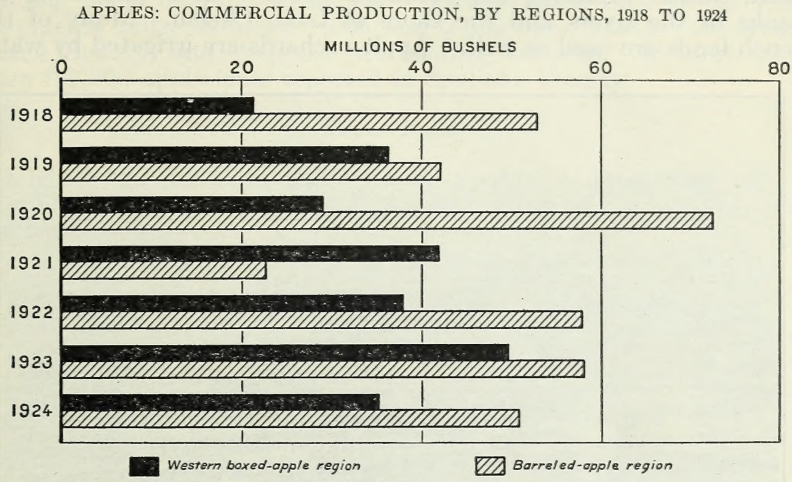


FIG. 2.—Commercial production of western boxed apples is increasing rapidly, while that of barreled apples shows no consistent gain

## THE WESTERN BOXED-APPLE REGION [2]

The home of the commercial boxed apple has always been in the valleys of the western mountain and coastal region from the Rocky Mountains to the Pacific. It reaches north to the Canadian border and beyond. It extends south nearly to the border of Mexico. Eleven States are included in the western boxed-apple region: Washington, California, Oregon, Idaho, Colorado, Utah, New Mexico, Montana, Arizona, Nevada, and Wyoming, in order of total production. Their rank is similar in order of commercial production, Nevada and Wyoming being omitted entirely. There are scattered boxed-apple districts in Kansas, Nebraska, and Arkansas, besides fairly well-defined box shipping districts in Georgia, Virginia, New York, and other eastern States.

### WASHINGTON

During the last few years Washington has become the leading commercial apple State. It leads not so much on account of acreage as because of large yields per acre and fairly regular crops—the

[2] Marketing of apples from sections other than the western boxed-apple region is discussed in United States Department of Agriculture Bulletin No. 1416 "Marketing Barreled Apples," by George B. Fiske, 1926.

results of a favorable climate, the practice of irrigation, and intensive methods of production. Reported car-lot sales for the State during 1924–25 show four leading varieties: Winesap, Jonathan, Rome Beauty, and Delicious. Other varieties of less commercial importance were Esopus Spitzenburg, Stayman Winesap, Yellow Newtown, and Winter Banana.

### WENATCHEE-OKANOGAN

The district in north-central Washington, known as the Wenatchee-Okanogan, comprises the counties of Chelan, Okanogan, Douglas, and Grant. The present acreage is largely in the Wenatchee, Okanogan, Entiat, Methow, and Columbia River Valleys, and along the banks of the rivers and the shore of Lake Chelan. Many of the bench lands are used as well. Apple orchards are irrigated by water

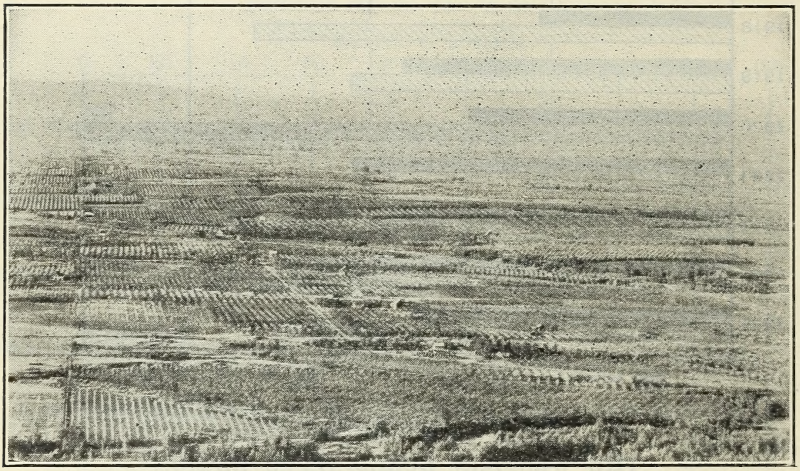

FIG. 3.—Orchards in Yakima Valley

obtained from the rivers, or from mountain creeks. The principal shipping points are Wenatchee, Cashmere, Omak, Chelan, Entiat, Peshastin, Monitor, Dryden, Pateros, Brewster, and Okanogan. Wenatchee is by far the largest in number of carloads shipped. The 30,000 acres of bearing trees in the Wenatchee-Okanogan region produced 17,500 cars in 1923 compared with 15,000 cars the year before. Apparently, the bearing area averages in good seasons about one-half a carload per acre.

The common size of orchards is from 5 to 20 acres. A few of the large commercial plantings contain up to 600 acres.

### YAKIMA

The apple district centering around Yakima extends for about a hundred miles along the valley of that name, from Kennewick to Ellensburg. Figure 3 is a typical view of orchards within this area. The valley in some places is 10 miles wide and produces not only large quantities of apples but many peaches, pears, and other fruits,

besides alfalfa hay, potatoes, corn, wheat, vegetables, and livestock. Thus the district is not wholly dependent on apples for its income. The principal shipping point is Yakima, but a considerable volume moves from Zillah, Grandview, Selah, Kennewick, Wapato, Naches, White Bluffs, Prosser, Toppenish, and Sunnyside. All of the apple land is irrigated with water obtained largely from the Yakima River or tributaries flowing into it. The principal varieties grown are Winesap and Jonathan.

### SPOKANE

The Spokane district ranks third among the apple-growing centers of Washington. It reaches its highest development in the area extending about 5 miles along the Spokane River east of the city. Shipments range between 1,000 and 2,000 cars yearly. Jonathan, Rome Beauty, and Wagener are leading varieties. In 1924 there were 797,000 apple trees reported in Spokane County.

### WALLA WALLA

Slightly smaller than the Spokane section in producing area is the Walla Walla district. Jonathan and Rome Beauty are the leading varieties grown.

### WHITE SALMON

Directly across the Columbia River from Hood River, Oreg., is the White Salmon district. The climate and general orchard practices are similar to those found in the Hood River district. Few of the orchards are irrigated.

## OREGON

For most of the recent seasons there has been little difference in volume of shipments between Oregon, California, and Idaho. Apple orchards occupied about 50,000 acres in Oregon in 1923.

From 1910 to 1920 the apple area of the State increased one and a half times. Most of the well-known orchard sections are in the valley regions lying east of the Cascade mountains and in southwestern Oregon. The apple counties in order of importance are Hood River, Jackson, Umatilla, Wasco, Union, Douglas, and Malheur.

### HOOD RIVER

The Hood River district in northern Oregon, 80 miles west of Portland, is responsible for at least half the commercial crop of the State. Hood River County in 1923 had 12,500 acres of apples, or more than the combined apple area in Jackson, Douglas, and Wasco Counties. Hood River Valley is 2 to 8 miles wide and the orchard area about 25 miles in length, lying both east and west of the Hood River. How completely the arable soil is utilized for orchard planting is shown in Figure 4. Apples are the most important commercial orchard product, but pears are grown in large quantities. Cultural methods are much like those practiced in Washington, but there is less complete dependence on irrigation because of the fairly abundant rainfall. The yield per acre is less than in several other districts, perhaps because of the prominence

of Yellow Newtown and Esopus Spitzenburg, two rather light-bearing varieties. Probably three-fifths of the entire apple acreage is planted to Yellow Newtown, one-fifth or more is in Esopus Spitzenburg, and the other one-fifth is made up of the Ortley, Arkansas Black, Winter Banana, and other varieties.

### ROGUE RIVER

Centering around Medford is the Rogue River district, which also ships some tonnage from Grant's Pass, Gold Hill, and other small stations. It is prominent as a pear-raising section, but has nearly as large an acreage of apples as Hood River Valley, mostly Yellow Newtown and Esopus Spitzenburg. The Yellow Newtown forms far more than half the crop, but many young orchards include other varieties in larger proportion. Rainfall is less than at Hood River, and irrigation is now considered very important.

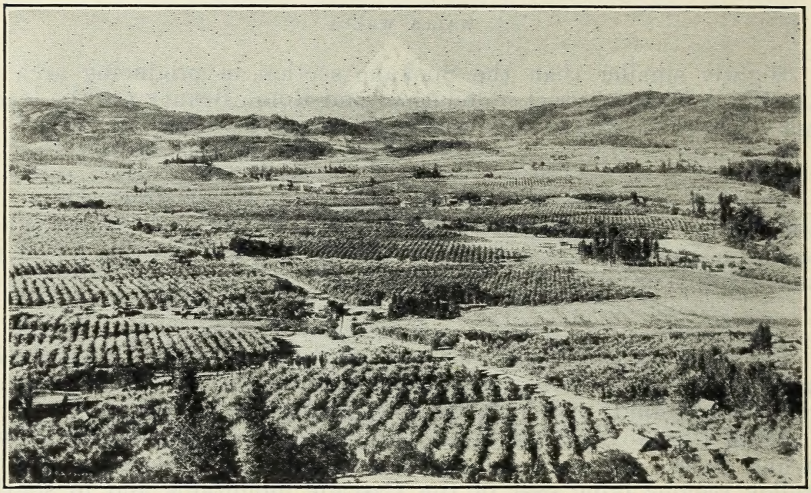

FIG. 4.—Orchards in Hood River Valley

### OTHER DISTRICTS

Apple growing is of some prominence in the Umpqua and Willamette Valleys and in the Milton-Freewater district. There are scattered commercial developments in various other parts of the State.

### IDAHO

In recent years Idaho has become more prominent among boxed apple sections and is usually classed with Washington and Oregon, although it is more recent than these sections in general development of the industry. Orcharding centers mainly in Payette and Boise Valleys, and around Payette, Fruitland, Emmett, and Nampa. About half of the production is in Payette district near Fruitland, Payette, Parma, Emmett, Weiser, and New Plymouth. The adjoining Boise Valley has similar conditions, but the apple area is not very large. There are about 5,000 acres in apples in the

Twin Falls districts in southern Idaho, and an area of about the same size in the Lewiston district. The State normally ships 3,000 to 6,000 carloads. Irrigation is general. The Jonathan, Rome Beauty, and Winesap are varieties prominent in the order mentioned. Methods are like those of the Pacific Northwest in general. A feature is the large proportion of the crop shipped as orchard-run or combination grades, and the extensive shipments in bushel baskets and in bulk to western markets.

### CALIFORNIA

In 1924, California had 59,345 acres of bearing apple trees, including only the commercial orchards. About one-half of these were in the three central counties of Santa Cruz, Monterey, and Sonoma, one-fifth were in southern counties and the rest were somewhat scattering. Half the young trees not yet bearing were in Sonoma County.

#### WATSONVILLE

There are two long-established apple-shipping districts in California. The Watsonville district in Santa Cruz and Monterey Counties is best known in the East for its shipment of the Yellow Bellflower early in the fall; but Yellow Newtown is the leading variety, although grown largely for export. The Yellow Bellflower is used in California in large quantities for drying. State production of dried apples in 1923 was estimated as slightly under 12,500 tons. The district of about 50 square miles has sometimes produced over 3,000,000 boxes of apples. Irrigation is not generally practiced, although there is some tendency toward the use of pumping systems supplied by wells.

#### SEBASTOPOL

Located north of San Francisco in Sonoma County, the Sebastopol district is famous for its Gravensteins, which supply eastern markets with their earliest high-grade boxed apples. Shipments average around 1,000 cars annually, and there is besides a heavy output of dried apples, about half the crop being used for this product. Varieties other than Gravenstein are mostly taken for drying. Irrigation is seldom practiced, because of sufficient rainfall and cool summer climate.

#### YUCAIPA AND BEAUMONT

In San Bernardino and Riverside Counties of southern California, the Yucaipa and Beaumont districts produce several hundred thousand bushels of Rome Beauty, Winesap, Delicious, and other kinds. The location is elevated, the climate cool, and the season rather late. Excellent care is given these orchards and the production is largely sold in local markets, principally in Los Angeles.

### COLORADO

The leading apple State of the Rocky Mountain region is Colorado. Most commercial orchards are on the western slope in Grand and Gunnison Valleys, with important shipping points at Grand Junction and Clifton in Mesa County, Paeonia, Austin, Hotchkiss, and Delta

in Delta County, and Montrose in Montrose County. On the eastern slope there are considerable plantings in Fremont County. Intensive cultural methods typical of the western apple region are employed, especially in Grand Valley. Jonathan, Winesap, Rome Beauty, and the Ben Davis group are leading varieties.

### UTAH

The commercial apple sections of Utah are in five or six counties in the region east of Great Salt Lake. The Provo and Tremonton districts are prominent. Production is increasing, but average shipments are less than 1,000 carloads. There is some local trade with towns and mining camps. Heavy shipments of box and bulk stock are made to southwestern markets. The leading varieties are Jonathan, Winesap, and the Ben Davis group.

### MONTANA

Heavy plantings were made in the Bitter Root Valley in western Montana, including many orchards of large area, but some of these have been neglected, because of market depression at critical times in their development and adverse climatic conditions. Volume of production at present is not great. The McIntosh does well in this section and is the leading commercial variety.

### NEW MEXICO

Pecos Valley is the principal apple section in New Mexico, with 8,000 to 10,000 acres around Greenfield, Dexter, and Hagerman. There is also a small shipping district in the southwestern part of the State. The harvest season in New Mexico is early enough to permit shipments of choice fall varieties to markets of southern Texas before there is much competition from the Northwest. The first considerable offerings of boxed Jonathans are from Pecos Valley. Varieties of the Ben Davis group also are prominent. Frosts make production irregular, but in 1923 shipments exceeded 1,300 cars.

### BRITISH COLUMBIA

The Okanogan district in British Columbia has many conditions like those of adjacent apple sections of Washington. The excellent quality of its product makes it a competitor, although its main crop varieties—McIntosh, Jonathan, Wealthy, Rome Beauty, Winesap, and others which constitute four-fifths of the crop—enter the market a few weeks later in the season.

The combined Okanogan districts of British Columbia reported 1,103,550 trees in 1920, of which 205,787 were Jonathan, 159,051 McIntosh and 109,859 Wagener, 91,322 Wealthy, 66,776 Delicious, and 38,802 Yellow Newtown. The Creston district reported 98,101 trees with Wealthy, Jonathan, Wagener, and McIntosh as leading varieties. The three Kootenay Lake districts reported 94,197 trees; the Kootenay River districts 112,893, and other sections 25,104. The total of all the districts was 1,443,845. Average yield of 56 commercial orchards of an official survey was 272 bushels per acre at an average cost of $1.14 per bushel in 1921. The average commercial crop of British Columbia (1920–1923) is over 3,000,000 boxes a year and is usually one-fifth to one-fourth of the commercial crop of

Canada and about one-twelfth as large as the average commercial box crop of the United States.

The region is as yet fairly free from many of the insect pests and diseases of older sections. Careful effort is made to prevent importation of infested nursery stock. The trade is largely with the prairie Provinces, but when crop conditions and prices afford an opening there are liberal offerings of British Columbia apples as far east as Boston and New York, notwithstanding the tariff, which, is equivalent to about 25 cents per box. About one-third of the commercial crop is exported.

### ADVANTAGES OF THE WESTERN APPLE REGION

The western boxed-apple regions have certain definite advantages which seem sufficient to overcome the handicap of distance from their principal markets. Irrigation is most important, assuring more rapid growth and larger yield than in eastern orchards, and at the same time promoting larger size of the fruit. The climate in the more favored districts promotes regular annual crops and fruits comparatively free from some of the defects, diseases, and injuries attending the moist hot summer or the severe winters of the East, and gives the fruit a superior finish. The natural fertility of most western apple districts is an advantage which may last indefinitely under careful soil management.

High yield means much to the orchardist. An average crop of 500 bushels in the Wenatchee district is able to stand high acre costs and still sometimes to return more to the grower than an average crop of 225 bushels in western New York. Average production cost per bushel may be higher in the West, but the return per acre is frequently greater. Orchard surveys have shown that only orchards having a high yield of the best grades are profitable to the western producer, taking one year with another.

Evidently success lies in the direction of large, regular crops of a quality fine enough to stand the necessarily high cost of production and marketing.

## HARVESTING

The bulk of the boxed-apple crop is picked during the latter part of September and October and the first half of November; only a small part of the total tonnage consists of the early production, like the Gravenstein and Yellow Bellflower of California. The main harvest season begins with Winter Banana, Wagener, Grimes Golden, and King David. About the time these kinds have been picked the Jonathan season opens. A week or 10 days after beginning the Jonathan harvest northwestern growers will be picking such varieties as Rome Beauty, Stayman Winesap, Esopus Spitzenburg, and Delicious. Most of the Yellow Newtown and Winesap crop in the Pacific Northwest is harvested during the latter part of October and the first half of November. Growers in general plan to have all apples picked by the middle of November, as after that date in most apple regions there is danger of freezing weather. Maturity of the crop in different parts of the same district may vary as much as two weeks.

### PICKING

Generally the pickers are instructed to gather the fruit carefully and to empty picking receptacles gently into the orchard boxes so that apples will not be injured. Pickers often fill the orchard boxes too full and the top apples in a box are crushed by the weight of boxes resting on them when stacked in the orchard. A drop-bottom picking bag holding nearly a bushel has been used almost universally (fig. 5) Recently the tendency has been to use a padded tin bucket with drop-bottom of canvas. Many growers feel that its use results in fewer bruised and stem-punctured apples. Pickers are paid either by the hour or by the box.

FIG. 5.—Apple picking in a western orchard

### HAULING

Apples are handled loose in standard apple boxes from time of picking until sorted for packing. Hauling from the orchard to the ranch packing house is done on low sleds, or on low-wheeled spring wagons drawn by horses or small tractors. To a large extent, motor trucks have replaced the team and wagon in hauling from the ranch. Many individual growers maintain small trucks, but growers, dealers, and growers' associations often contract their hauling to firms operating truck lines. It is not uncommon for a large truck to haul as many as 350 packed boxes, although the average truck hauls a smaller load. Figure 6 shows a truck loaded with 400 boxes.

### GRADING

Grading has been the backbone of the boxed apple industry and enforcement of the grades has necessarily been one of the greatest tasks confronting the industry. Boxed-apple growers were pioneers in establishing standard grades through which their product has

gained recognition and its market integrity has been assured. Only by establishing and adhering to such standards has the boxed-apple industry been able to compete with other apple-producing sections more favorably located as to markets.

Many of the far western States that pack boxed apples have established definite grades for this product and provide means and methods of forcing growers to grade and pack their fruit according to law. Extra Fancy, Fancy, and C grades are those most commonly packed. A lower, or fourth, grade is sometimes put up. A Combination grade is made by combining Extra Fancy and Fancy or Fancy and C

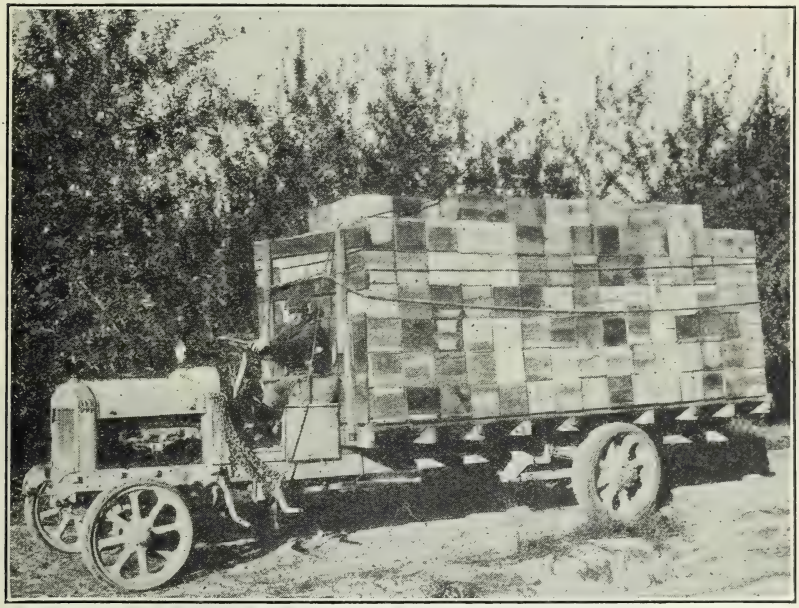

FIG. 6.—Motor truck used for the haul to the packing house

grades. An Orchard-run grade consists of Extra Fancy, Fancy, and C grades.

These States use the grades mentioned, but there is some difference between the requirements of the grade as packed in various States. For example, there is no official or recognized definition of Extra Fancy common to all boxed-apple States. In general, only the best of their apples are packed in this grade, but color requirements for various varieties may vary as well as tolerance for blemishes and other deficiencies.

### SORTING AND PACKING [3]

In packing houses other than those on very small ranches, separate crews are used for sorting and packing. The sorters, mostly women working by the hour, inspect each apple and determine its correct grade. Packers are usually paid 5 to 7 cents per packed box. The

[3] For more detailed discussion see Farmers' Bulletin 1204, "Northwestern Apple Packing Houses," by Raymond R. Pailthorp and Harold W. Samson, and Farmers' Bulletin 1457, "Packing Apples in Boxes," by Raymond R. Pailthorp and Frank S. Kinsey.

bulk of the tonnage is put up in packing houses, either by individual growers on the ranch or by growers' cooperative associations. Some growers haul their fruit to commercial packing houses, where the apples are packed, stored, and shipped at a certain price per packed box. Figures 7 and 8 show two well-packed boxes of apples.

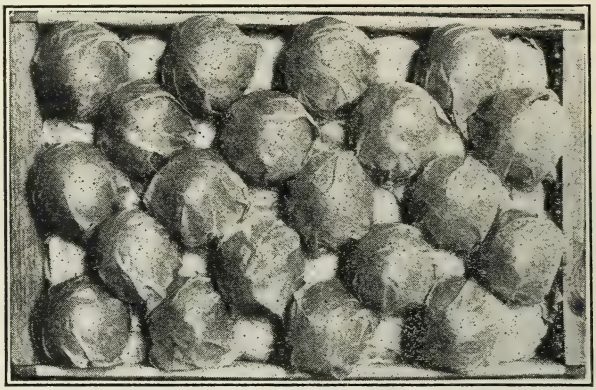

FIG. 7.—Good pack of boxed apples

The packing equipment is not moved about in the orchard, but a convenient point either in the orchard or along a railroad siding is selected for the packing house, as packing and storage rooms are usually parts of the same building. Boxed apples are packed from hand tables, sizing machines, and grading belts. The bulk of the tonnage passes over hand tables (fig. 9) and sizing machines (fig. 10),

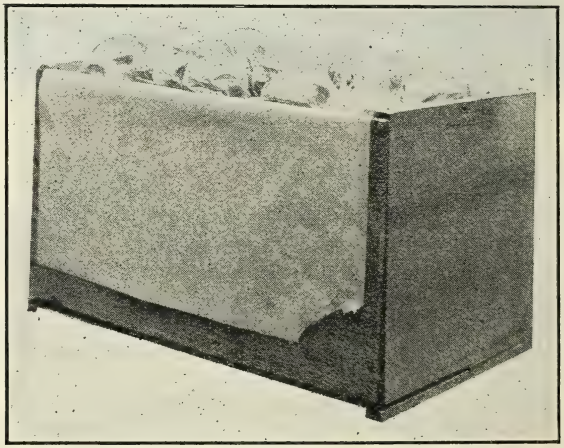

FIG. 8.—Packed box showing correct bulge

which are used in both ranch and central packing houses. Grading belts are less used than hand tables or sizing machines. The belt carries the ungraded apples before the sorters, who separate the apples into grades as the fruit passes along. The sorted apples are placed in convenient bins. Sorters do not usually size the apples. The packers are stationed beside the bins and size the fruit as they pack.

FIG. 9.—Packing boxes from hand tables

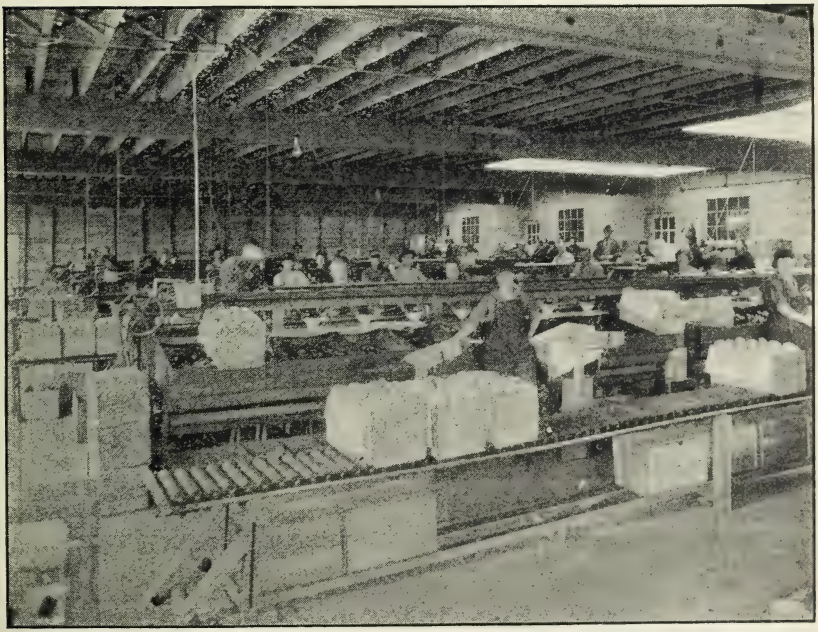

FIG. 10.—Packing from sizing machines in a well-equipped western packing house

Sizing machines are in very general use in most boxed-apple sections. Their chief advantage lies in the fact that the fruit is sized for the packer and the human element does not enter into the operation. Most machines size the apple on the basis of weight rather than measurement. The smaller machines, which are used by the small growers, handle one or two sizes; the larger ones, handling three sizes, are used by large growers and community packing houses.

Each packer has a packing stand or bench holding from one to six boxes and uses a tray to hold the apple wraps. Most packing houses handling any large quantity of apples are equipped with gravity conveyors to take the fruit from the packers to the lidding press. Conveyors are also used to carry boxes of fruit from the hauling trucks to the packing-room floor or loose-fruit storage, as well as to deliver packed boxes from the lidding press to the storage room or car. Similar equipment is used to deliver fruit from the packing room to lower floors for shipment or storage. Lidding presses are used to draw the covers of the boxes into place and hold them while the lidder is doing the nailing. The variety, grade, grower's name, and the count are stamped on each box.

### BOXING

The standard apple box is 18 inches long, 11½ inches wide, 10½ inches deep (inside measurements), and holds slightly more than a struck bushel. It is assumed for statistical purposes in this bulletin that three boxes are equivalent to one barrel of apples, but in fact three boxes contain more than a barrel by 535.5 cubic inches, or about 8 quarts. Box shook, including sides, ends, bottoms, top, and cleats, is shipped in separate bundles from the mill and made up by the grower.

Lining paper for the boxes is used with the better grades of apples. Two sheets, 17½ by 26 inches in size, are used in each box and overlap in the bottom and over the top of the apples. The wraps most commonly used are 9 by 9 inches, 10 by 10 inches, and 11 by 11 inches.

### OILED-PAPER WRAPS

The use of oiled-paper wraps has increased rapidly in the Northwest in the past two seasons. At least one-third of the commercial boxed-apple crop—12,000,000 to 15,000,000 boxes—in the various northwestern shipping sections was wrapped in oiled paper during the season 1923–24, compared with 600,000 boxes the previous shipping season. By far the most important consideration leading to its increased use is that oiled paper is believed to have reduced and, in most cases, entirely prevented the damage by scald in common or cold storage and in transit. The oiled wrapper also seems to have a retarding effect on the life activities of the skin of the apple, slightly delaying the development of yellow in the ground color. The additional cost over ordinary wrappers is only about 2 cents a box.

## INSPECTION

Thorough inspection has served to eliminate deception and dishonest packing, to encourage the production of high quality fruit, to reduce waste by preventing the shipment of inferior fruit, and has done a great deal towards stabilizing the industry.

The States that have compulsory laws for packing apples under definite grades provide an inspection system for enforcing the grading laws. It has been impossible for them to inspect each car shipped, and their duties are mainly of a police nature, but local public sentiment favors the grading laws and little difficulty has been encountered through shipping of apples not up to grade. Cooperative shipping and selling organizations and local cash buyers have maintained extensive private-inspection forces to insure integrity of their packs and have thus been important factors in aiding enforcement of the laws. They label each box with the name of their organization, and as a matter of pride and sound business, it is their concern to see that each box of apples is up to the grade as marked.

In 1922 the Federal service was expanded to include shipping-point inspection for fruits and vegetables. Growers and shippers of boxed apples were among the first to ask for this service and they are making extensive use of it. Cooperative agreements have been worked out between the State and Federal authorities whereby inspections are supervised by Federal employees at various shipping points. This service is not compulsory but is used extensively by shippers and buyers. It was estimated that Federal certificates were issued at shipping points on approximately 40 per cent of the total 1924–25 tonnage originating in States that pack boxed apples. The inspector certifies the contents of the car as to grade and condition at time of shipment and a fee is charged which covers approximately the cost of the service. This certificate is accepted as prima facie evidence in all United States courts. As much of the boxed-apple tonnage is bought f. o. b. shipping point, these certificates are used extensively as a basis for settlement between shipper and buyer whenever a controversy arises as regards grade or condition at time of delivery on the market.

## FINANCING

In most sections the need of working capital to pay for growing, harvesting, and packing operations is greatly in excess of the supply available from local business agencies, so that a large part of these funds comes from eastern and midwestern financial centers. As soon as shipping begins, the shippers are in a more favorable position to finance their operations and meet their obligations to the growers. It is a practice of all types of apple shippers to sell as many cars as possible on f. o. b. orders. When such cars are shipped, drafts are drawn on the buyer. The shipper presents the bill of lading with the draft to his local banker. In turn, the banker gives the shipper credit for part or all of the amount of the draft and presents it for collection through a correspondent bank.

Advances by local dealers to the grower may be either in cash or supplies, to be used in producing and delivering the crop. The loan is usually based on a per-box basis, amounting to about 50 per cent of the probable selling price. Supplies are usually charged for at current retail prices and handled at the rate of 8, 9, or 10 per cent interest. As security for advances, a crop lien is frequently taken, although in many cases the marketing contract or selling privilege given to the dealer is considered sufficient security. Lenders may also accept growers' notes as security. Traveling dealers finance the growers directly or through local dealers.

To obtain a sufficient volume of business, private sales agencies and commission houses often find it necessary to finance the individual grower or cooperative association. In making these loans they require security similar to that which is acceptable to the cash buyer.

Cooperative associations have methods of financing the growers. It is partly through efficient handling of this phase of their business that they are able to attract and hold their membership. A local association usually has contracts with its growers for delivery and disposition of the fruit. To obtain money to make cash advances, associations may take the growers' notes to the bank and use them as security on which to borrow. They may use a crop mortgage or marketing contract also as security for a loan. Cooperative associations often obtain cash advances from private sales organizations and commission firms. In each case the growers' notes, together with the marketing contract, are taken as security.

Dealers, cooperative associations, and selling agencies who have capital stock and warehouse properties may offer them as security for loans.

## SELLING METHODS

Growers of boxed apples market their fruit through various agencies. Cooperative associations sell their own fruit or contract its sale to private sales organizations. Local dealers are also an important factor in the marketing of the fruit. In some seasons traveling dealers and commission merchants are active in the deal.

### COOPERATIVE MARKETING

Cooperative marketing associations are important, especially in Washington and Oregon. A single group of growers may form a local association and hire a salaried manager to handle the general business and sell the fruit. Local groups may join federated associations which either hire a salaried manager to sell the fruit, or contract the selling to a private sales organization. Locals have been created to perform various activities connected with the harvesting of the annual crop, to prepare the fruit for market, to operate packing houses and storage plants, to purchase supplies, to conduct advertising campaigns, and to sell the products of the farms and orchards.

One reason for collective activity is that many of the things which need to be done in getting fruit ready for market can be done more efficiently and more economically when the activities are conducted on a large scale. Furthermore, sales can be more quickly made when standard products in uniform packages are offered in carload quantities.

The locally owned and controlled associations seem to be well qualified to deal with the problems that arise in connection with harvesting, grading, and packing apples. Problems connected with activities that are largely local are satisfactorily handled by local agencies. The selling function is performed by some of the larger locals and by federations of locals contracting the selling to selling agencies.

### ORGANIZATION

No different form of organization is required for marketing boxed apples than for marketing other orchard products. Associations for such purposes may be formed with or without capital stock. They may or may not have binding contracts, or pooling of the returns, or actual ownership of the products handled.

Organizations handling boxed apples are of two types of structure, the association and the federation. The association is an organization in which the growers are members and vote directly or by proxy in the affairs of the association. The federation, on the other hand, is a central association made up of several local incorporated organizations. Membership in such federation is usually limited to local associations which, in turn, are composed of grower members. Grower control in federations is accomplished by representation of each local association in a central meeting for election of directors or by proportional representation in the central board of directors.

Federations are likewise of two distinct kinds, the centralized and the decentralized. The difference, however, lies not so much in the structure of the organization as in the division of power and marketing functions between the central organization and the local units. In the strongly centralized type of federation practically all of the responsibility may be placed upon the overhead organization.

In the strongly decentralized type most of the marketing functions, such as assembling, grading, packing, warehousing, and often the financing, are local problems. Here the federation functions mainly in the selling and advertising. In the cases where such decentralized associations have arranged with outside agencies for the advertising and selling, but little work remains for the overhead organization except central supervision of the business.

### ASSOCIATION METHODS

Reports to the United States Department of Agriculture from 26 farmers' business organizations handling boxed apples indicate that all but two of the associations pool the returns for similar varieties and similar grades. In 12 of the associations the pooling period is for the entire season. In several other organizations the pools are for the periods varying from two to six months. In two instances 40 days is the maximum time for the pools to run.

All but two of the reporting associations had contracts with their members. The number of markets reached by different associations in handling the 1922 crop ranged from 19 to 252. Of the 26 associations, 23 reported selling on an f. o. b. basis. The bulk of the tonnage is sold in this way, but some cars are consigned, sold delivered, or auctioned. Nine of the associations had their own selling forces and 16 used a selling agency outside their own organizations.

Of the 26 associations, 16 reported that they advertise the products handled. Assessments for advertising vary from a half cent to 4 cents a box. The amount expended in connection with the marketing of the 1922 crop ranged from $200 to $35,000.

It is estimated that the reporting associations handled over 8,000 cars, containing over 6,000,000 boxes of apples of the 1922 crop, valued at approximately $8,000,000.

One association with more than 1,600 cars to be marketed made shipments to the United Kingdom, Scandinavia, the Philippine Islands, and China. Another association made sales in the United Kingdom, Denmark, Canada, Mexico, Cuba, and South America.

#### PRIVATE SALES ORGANIZATIONS

Private sales organizations contract to sell the fruit for a stipulated fee per box. Some of them own or lease warehouses where they pack and store for the growers. Some private sales organizations buy and sell on their own account as well as sell for growers; others do not own warehouses or buy fruit, but sell only that belonging to the growers or to growers' organizations.

#### DEALERS AND BROKERS

Local dealers purchase fruit from growers, buying for spot cash or contracting to pay at some future date. Some of these dealers accept fruit on consignment, especially in years when the apple market is uncertain and eastern buyers have not placed orders or made advances to the local dealers so that they in turn are in position to buy or contract with the grower. When the apple crop is short, eastern dealers make cash advances readily to the local dealer, or he may be able to secure local capital. In either case, he is then properly financed and in a position to offer cash to the growers. These local dealers are important factors in the boxed-apple sections. Many of them own warehouses and have developed a merchandising department to advance supplies and equipment to growers whose fruit they handle.

Many eastern commission houses and wholesale fruit jobbers are represented by traveling dealers who are sent to the fruit districts to purchase apples for cash or to secure consignments. Their methods of operation are similar to those of the local dealer, except that they do not merchandise the grower's supplies or own local packing and storage houses. They may deal directly with the growers, local dealers, cooperative associations, or selling agencies. They may make cash advances to the individual growers, cash buyers, or growers' organizations.

Some firms with head offices in the East maintain district offices in the various fruit sections and solicit apples to be sold on a percentage commission basis instead of for a definite sales charge per box. Such firms may buy and sell for their own account as well as for the grower, or they may handle only grower-owned fruit. They may or may not own warehouses in the fruit districts in which they operate.

The bulk of the tonnage is sold through brokers located in car-lot markets, although car-lot buyers often deal direct with the seller. Local sales agencies, affiliated with national sales agencies, have exclusive brokers in the large car-lot markets. These brokers handle many commodities other than apples. Some local dealers and sales managers of large cooperative associations have direct brokerage connections in various car-lot markets. If the tonnage is large the broker may handle only the offerings of one local dealer or one cooperative association.

### AUCTIONS ON F. O. B. BASIS

The growth in facilities for official inspection at shipping points has tended to increase the sale of apples on the f. o. b. basis. Often the sales of cars f. o. b. are "rollers" en route. Some sales are effected by a comparatively new institution, the f. o. b. auction sale. These auctions are held in the city market centers, the inspected car lot being sold on description to the highest bidder among the competing buyers. Bids are made personally or sent to the auction by wire. Prices from distant cities are about the same as the city market price less transportation costs. Being positive, unconditioned, cash sales they are usually a little lower than the basis of regular f. o. b. sales at shipping points, although it is asserted that the difference in price levels in various cities tends to give the f. o. b. auction seller the benefit of the markets where highest prices prevail at the time of sale.

## TRANSPORTATION

As the boxes leave the packing room they are segregated and stacked as to variety, grade, and size. They are then trucked either into storage or, in case of immediate shipment, into cars. Some houses are equipped with moving belts and gravity conveyors which carry the boxes from the packing room to storage or to the car.

Refrigerator cars are required for transporting the apples but when refrigerator cars are in short supply a few shipments are made to near-by points, in the fall, in box cars. No safe and economical method has been devised to protect box-car shipments from the hazards of freezing in winter weather or damage from high temperatures during the early fall.

### KINDS OF SERVICE

Four arrangements are provided for the protection of apple shipments and definite tariffs are provided for each kind of service. "Standard ventilation" is used extensively in the late fall when shipments will encounter cool weather in transit. From October 15 to April 15 shipments can not be billed "standard ventilation" as the carriers will not assume freezing risks.

Between October 15 and April 15 a shipper may ship under "shippers protective service." Such service is used if the shipper believes that the apples will carry without refrigeration and he usually furnishes a caretaker who either ventilates or heats the car while in transit. The railroad does not assume freezing risks on such shipments but allows free transportation for the caretaker to the destination and return. The shipper not only furnishes a caretaker but furnishes any equipment such as stoves and fuel used in heating the car.

Under "carriers' protective service against cold" a charge is made in addition to the freight rate and the railroad assumes the freezing risk in transit. This service is available between October 15 and April 15 and it is used by the shippers for the bulk of the winter shipments. Only those railroads that operate west of Chicago offer heater service for the protection of perishables. These roads protect the load by placing an oil or charcoal heater in each bunker.

"Standard refrigeration" provides for the refrigeration of the shipments and an additional charge over the freight rate is paid by

the shipper for this service. Under this service the railroad agrees to keep the car iced in transit and is liable for the deterioration of the apples unless it is shown that they were in poor condition at time of shipment. This service is used extensively for summer, early fall, and spring shipments. If shipments are billed "standard refrigeration" between October 15 and April 15, the shipper assumes freezing risks.

### THE CARLOAD

A 756-box loading is used most extensively for boxed-apple shipments. Under heater and refrigerator service a space is left between the doors to permit bracing the load; under ventilation the car is often loaded solid without the brace. When loading for refrigeration care is taken to provide uniform air spaces between the rows of boxes.

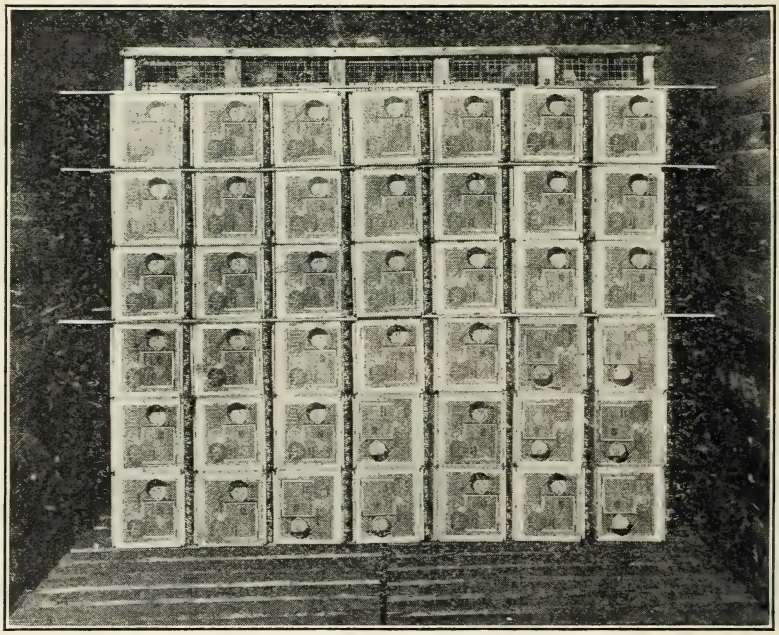

FIG. 11.—Car of boxed apples loaded for heater service

In loading for heater service the boxes are stacked solid across the car, leaving maximum spaces between the load and side walls instead of dividing the space between the rows (fig. 11). Railroads often instruct shippers to load only four boxes instead of seven in the first or bottom stacks next to the bunkers when the shipment moves under heater service. This reduces the load to 750 boxes but insures greater protection to the apples. The openings between these boxes provide channels through which the air can return to the heater, thus facilitating movement of heated air within the car.

### WATER TRANSPORTATION

Since 1914–15 apples have been carried under refrigeration, by boat direct from Pacific coast ports to the Atlantic seaboard, although the bulk of the tonnage has moved by rail. In 1920 one steamship

company began refrigerator service from the Pacific coast to European ports, and in 1921 five steamship lines offered such service. Exports through Seattle and Portland have increased each year and these ports are now used extensively for such shipments.

Intercoastal water transportation is not used extensively for the movement of boxed apples. A few experimental shipments were made in refrigerated ships in 1914. During the war this activity ceased and it was not until 1920 that intercoastal service was again offered the shipper. Since that time several companies have begun such a service. There are many things to consider when viewing the practicability of intercoastal shipment. Water rates between Pacific and Atlantic seaboards, including the short rail haul from producing sections to ports of embarkation, have been less than all-rail rates. Winter shipments by water are not subject to freezing hazards encountered by rail shipments. To offset these advantages several important facts must be taken into consideration such as trade customs and methods of sales.

Many of the apples are sold on an f. o. b. basis. Most of the remaining tonnage is rolled toward the East and sold in transit. If such unsold fruit were shipped by water there would be no opportunity for distribution to inland markets west of the Missouri river and it is doubtful if local rates applying to points any great distance from the Atlantic and Gulf seaboards could be absorbed. The eastern buyer has preferred rail shipments, as he is slow to consent to new and unproven methods of transportation. It is maintained, however, that intercoastal service is practical and economical for shipment from one seaboard to the other for such shipments as do not have to be back hauled. Port facilities at certain places must be improved to provide refrigerated storage, which is an important factor in the transportation of boxed apples and should prove especially practicable for late varieties which the trade stores at seaport towns for late winter or spring sales.

## STORAGE AT SHIPPING POINTS

As the production of boxed apples has increased, growers and shippers have realized the economic necessity of providing adequate storage facilities at shipping points. A wide difference of opinion exists, however, regarding the quantity of apples which should be stored at shipping point in comparison with that stored at eastern gateways, such as Minneapolis, Omaha, Denver, Kansas City, and Chicago.

Some growers and shippers urge in favor of eastern storage its convenience in marketing and the avoidance of danger from freezing. Other growers and shippers favor storage at shipping point adequate for the bulk of the crop so that shipments need be made only as market demands are apparent. Thus the storage and marketing is more directly under control, and the shipping and marketing season extended as conditions may require. Regardless of arguments in reference to marketing as it relates to point of storage, it is advisable to place certain varieties, like Jonathan and Delicious, in cold storage temperatures as soon as harvested, if they are to be delivered to the city dealer in prime condition for retail distribution. The condition of late varieties, such as Yellow Newtown and Winesap, can be im-

proved through the use of cold storage instead of common storage. Many shippers realize the importance of cold storage and are making efforts to provide such facilities for handling their apples. The buying trade also has learned to favor the purchase of such fruit. It has been estimated that in the Northwest, 75 to 85 per cent of the pack of standard varieties is bought by the trade with a view to cold storage in the East. The quantity, location, and season of these stocks are described under "Cold Storage Holdings."

### COMMON STORAGE

There are many types of common storage, some of which are nothing more than sheds or basements of houses and store buildings. Such places are not suited for keeping apples in good condition. But a type of insulated common storage is used east of the Cascade Mountain Range in the Pacific Northwest apple sections which has

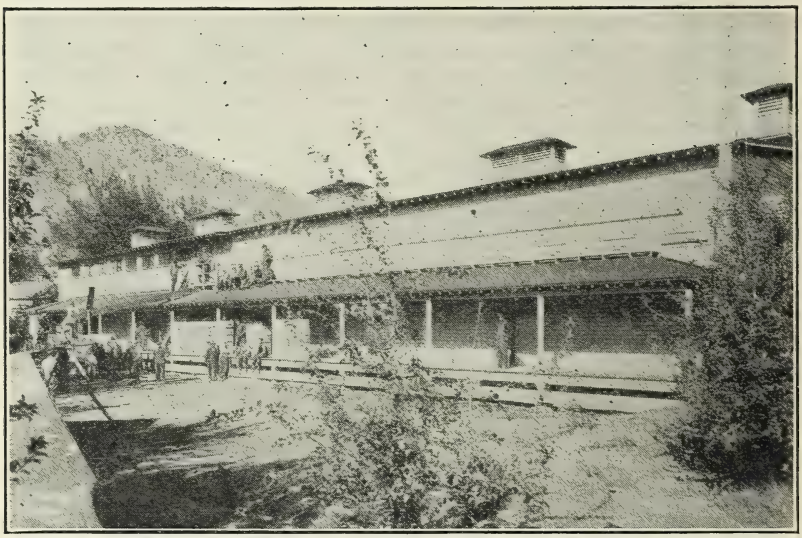

FIG. 12.—Good type of packing and common storage house

proven fairly successful for handling late storage varieties such as Winesap and Yellow Newton. To cool the fruit, openings are provided near the ground or lower part of the building for entrance of cold air. This air is released directly beneath a slatted floor on which the boxes of apples are stacked. Shafts leading upward through the ceiling and roof remove the warm air given off by the fruit in cooling. The circulation of air in this type of storage is obtained through natural ventilation induced by the difference in weight of air at different temperatures. Motor-driven fans are sometimes used to assist the natural ventilation. Figure 12 shows a good type of common storage and packing house in the Pacific Northwest.

### COLD STORAGE

The ideal range of temperature for storage of most varieties of apples is about 30 to 32° F., and without the provision of mechanical refrigeration it is impossible to maintain such temperatures through-

out the storage season. Correct temperatures for long periods can not be maintained in common storage even of the best type. In Figure 13 boxed apples in cold storage are shown stacked with air spaces for ventilation.

FIG. 13.—Boxed apples in cold storage

The approved construction features for either a good cold storage or common storage are identical as to use of similar building and insulating materials. In the apple-producing valleys of the Pacific Northwest most cold storages are of masonry or poured concrete construction (fig. 14). Insulation materials consist mainly of either dry planer shavings or cork. Mechanical refrigeration with temperatures 30 to 32° F. is supplied either by piping the refrigerant directly through the storage rooms, or by the use of a bunker system in which

FIG. 14.—Cold storage in producing section; a large plant devoted mostly to boxed apples

the refrigerating coils are confined to a separate room and the cold and rather moist air supplied from it to the storage room by means of a large fan. There should be sufficient moisture to prevent shriveling, yet not enough to favor the growth of fungous organisms.

## USING CULL APPLES

Apples below packing grades are classified as culls and are most often used for manufacturing purposes and cider stock. In certain seasons canners, dehydrators, and evaporators use many C and fourth-grade apples.

The greatest handicap of western orchardists, apart from high cost of marketing, is lack of sufficient demand for apples below standard shipping grades. Eastern growers often rely on sales of cider apples and canning stock to pay expense of harvesting and marketing.

Combination of principal local reports indicates that the equivalent of about 4 per cent of the average commercial crop of the North-

FIG. 15.—Loading a car of cull apples

west is used for drying, canning, and various special products, about 2 per cent for cider and vinegar, and about 10 per cent goes to waste. In the Northwest, taking the great Wenatchee, Yakima, and Hood River districts as typical, sometimes less than half the culls can be sold when prices are low.

Both Oregon and Washington have laws prohibiting the shipping of cull apples out of the State for any except manufacturing purposes. Each manufacturer is required to put up a bond of $500 per car for each car of cull apples shipped out of Washington as a surety that he will not resell or dispose of the apples for any purpose except manufacturing. This is done to keep cull apples from demoralizing the market for better grades of fruit. Loading cull apples for shipment by rail is shown in Figure 15.

### DRIED APPLES

The greatest centers of the dried-apple industry are San Benito, Santa Cruz, and Sonoma Counties, Calif., which produced from one-third to one-half the total of the United States output during the census year 1919. Wayne County, N. Y., has held long-established leadership in the East. Virginia and Arkansas, as well as the Pacific Northwest, have made rapid gains in recent years. The greater part of the western product is made from the California Yellow Bellflower and a very large share of the eastern dried apples from the Baldwin and Rhode Island Greening.

The census of manufactures for 1921 showed an output of 22,975,189 pounds of dried apples compared with 46,623,599 in 1919, with 54,957,003 in 1914, and 44,568,244 in 1909. The total production for 1921 was evidently much reduced by the extremely short crop of that season, except in California where it was only slightly less than in 1919. California and New York are the leading producing States, and in 1919 together supplied almost two-thirds of the total output or 15,477,039 and 13,524,019 pounds, respectively. Arkansas and Washington follow next in order of importance with 6,720,070 and 4,044,090 pounds, while Oregon and Virginia were the only other States of consequence with 1,577,441 and 1,274,125 pounds.

Average car-lot shipments for the five years 1919 to 1923 were 34,908,000 pounds, but total shipments do not follow the output closely from year to year, as this product is capable of storage for considerable periods, and accumulated supplies may be drawn upon to offset a temporary deficiency. This is evidenced by the export figures for 1921 which total 19,962,306 pounds of dried apples, only about one-fifth less than in 1919, although total output fell off more than half. Imports, however, increased from 158,085 pounds in 1919 to 1,781,759 pounds in 1921, but again decreased to 45,664 pounds in 1922.

The dried-apple output comprises in addition to the machine-made product of commercial factories, as reported by the census, the product of farm evaporators, and a few hundred tons of sun-dried fruit.

After paring, coring, bleaching in sulphur fumes, and slicing, the machine-manufactured product is usually evaporated with the aid of heat supplied by various types of furnaces. By one method the hot air rises from the furnace into the room above, which is filled with trays of the sliced fruit. Sometimes revolving fans are used to increase the current of hot air. There are also equipments which force the gases from the fire directly over the fruit. Some driers move the fruit on belts through heat and bring it out dry. Still another type of manufacture dries the fruit at comparatively low temperatures in a chamber from which the air has been exhausted. This process leaves more of the natural color and flavor. A quality product of this kind affords one of the most promising outlets for substandard apples of sections remote from markets and provides a choice produce for export trade, which already takes half the production of dried apples.

Vinegar is often made as a by-product at the evaporation plants. Apples removed in process of thinning the crop are sometimes used for jelly manufacture.

### CANNED APPLES

The output of canned apples from the northwestern sources in 1923 was unofficially estimated at 747,651 cases for Washington, 358,972 for Oregon, 23,571 for California, and a considerable quantity, not stated separately, for Idaho.

Many apples are shipped to factories from Yakima, Spokane, Milton, Freewater, Walla Walla, Hood River, White Salmon, Eugene, Yoncalla, Roseburg, Medford, and Ashland. Most of the apples are shipped in bulk, 20 to 25 tons to the car. A movable bulkhead is used in the car, so that apples may be put in and taken out without bruising.

Canning apples are shipped from packing plants in the various producing sections or from the growers' warehouses where grading is being done, in bulk or in lug boxes. Uusually they are bought by weight at prices ranging from $6 to $12 per ton according to season, quality, and location, but mostly $6 to $8, although prices as low as $1.50 and up to $15 have been reported, owing to great variations in supply and demand from season to season.

Canning apples are peeled, seed pockets or cores removed, and all blemishes cut out by hand. The apples under 2¼ inches and those not good enough for other purposes are used for cider making. The peels and cores are pressed for vinegar.

## THE MARKET SEASON

The shipping movement of boxed apples (fig. 16) does not become generally active until September. The chief exception is California, which ships a few cars in June, 100 to 300 cars usually in July, and 500 to 1,000 in August, but, in July 1923, California shipments reached nearly 1,300 cars. These are mostly Gravensteins, with country-wide distribution. Washington ships 20 to 40 cars in July, chiefly Yellow Transparents, which are marketed within the boxed-apple territory. In late August the boxed-apple States are all shipping. California still leads, with New Mexico Jonathans usually second in volume. Some early-fall apples go out from Washington, and there is a scattering movement from other box-shipping States. September shipments are general, with Colorado, Idaho, and Washington Jonathan and Delicious prominent features. The combined movement reaches height in October, with about one-third the box total of the season averaged for that month. Oregon sometimes reaches its height in November, although shipments in general show marked decrease. With the arrival of winter conditions, shipments decrease sometimes one-half in December, and thereafter the usual trend of movement is downward all winter, and becomes only a few hundred carloads in May and June. The last carloads are chiefly Winesap and Yellow Newtown from cold storage in Washington, Oregon, and California.

Supplies of boxed apples at most of the large cities follow the same general time schedule, as indicated in Figure 17. They increase gradually and reach their height in October or November, then decrease gradually, closing in June, and averaging in the later months about half the volume at the height of the season. Many cities show a temporary increase with the return of mild weather in early spring.

APPLES: CAR-LOT SHIPMENTS FROM PRINCIPAL STATES OF THE WESTERN BOXED-APPLE REGION, MONTHLY AVERAGE, SEASONS 1918 TO 1923

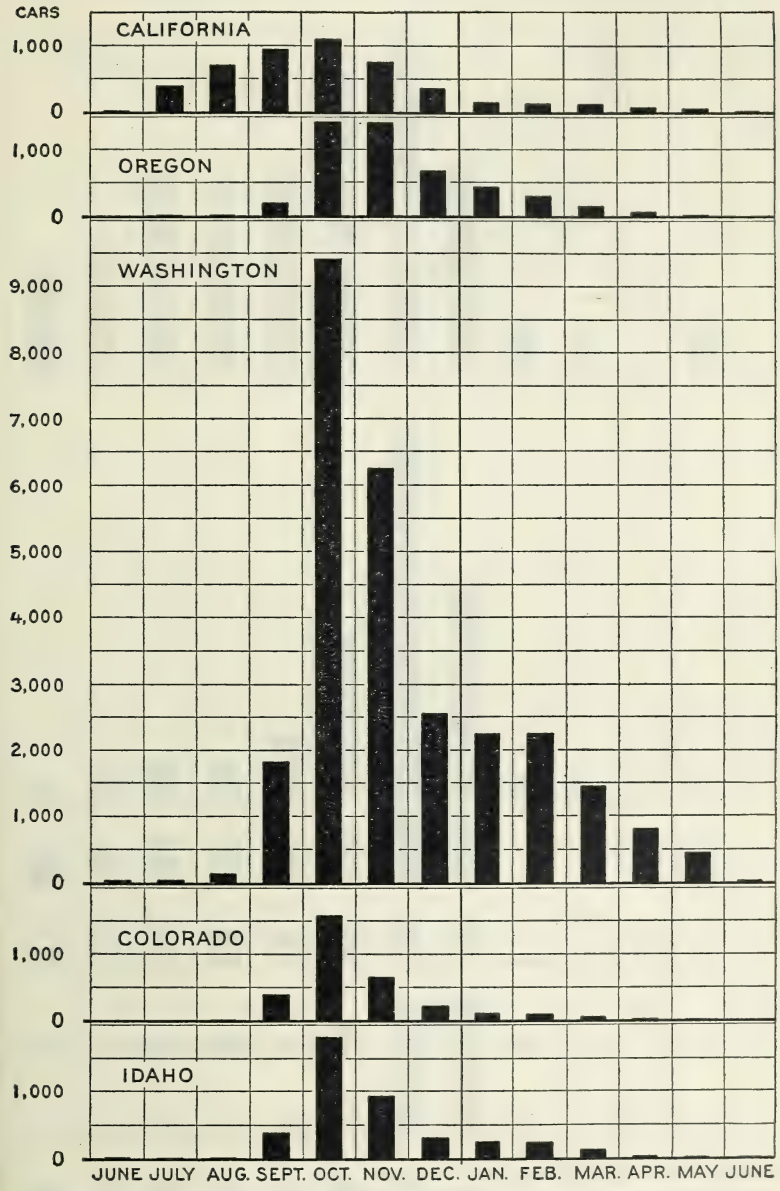


FIG. 16.—October is always the peak month in shipments of apples. An average of one-third of the commercial boxed-apple crop moves in October

APPLES: CAR-LOT UNLOADS FROM THE WESTERN BOXED-APPLE REGION AT SEVEN PRINCIPAL CITY MARKETS, MONTHLY AVERAGE, SEASONS 1918 TO 1923 (BOSTON 1920 TO 1923)

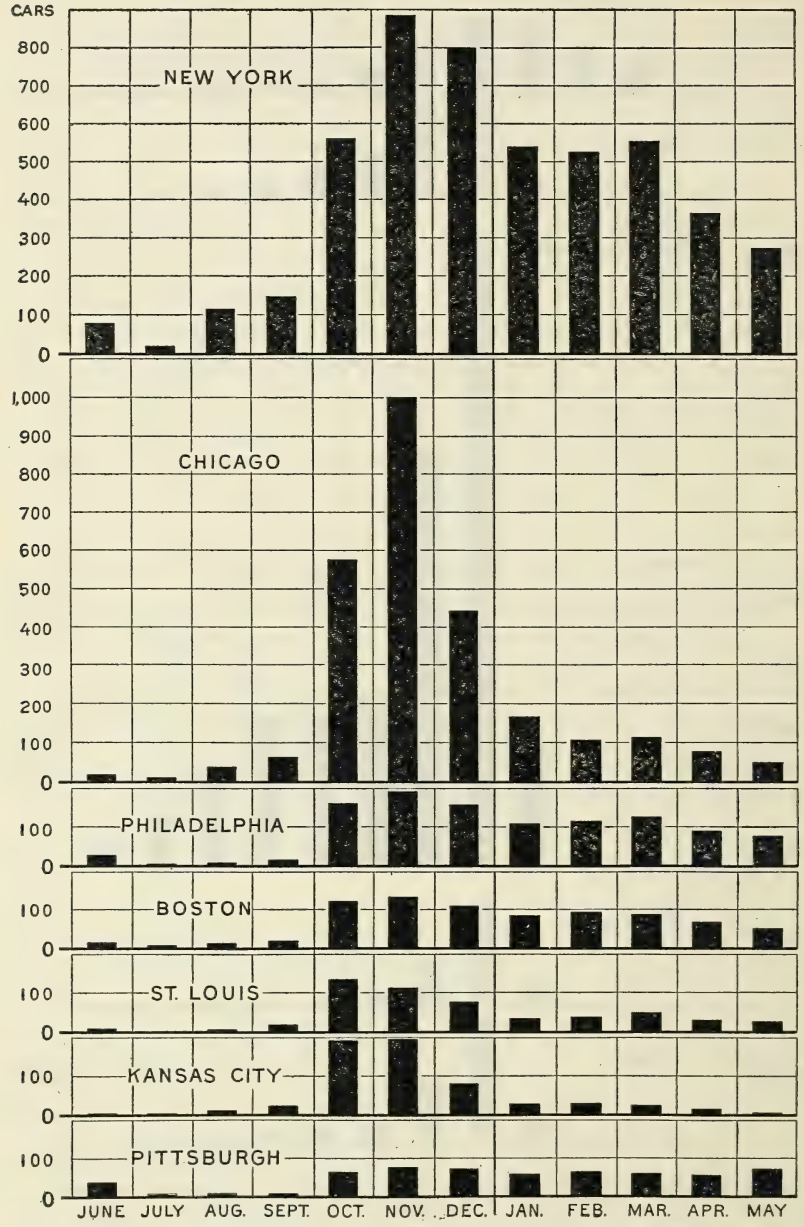


FIG. 17.—Heaviest unloads of western boxed apples occur in most cities in November, when a large volume goes into storage

A feature of midwestern cities, especially Chicago, Minneapolis, and Kansas City, is the active early movement of apples to cold storage, including very large quantities of western boxed apples. Thus Chicago receives half the total supply of apples in October and November, while at Pittsburgh, for example, receipts are fairly uniform throughout the active market season, including many shipments from country cold storage.

## DISTRIBUTION OF BOXED APPLES

The boxed-apple crop has a remarkably wide distribution. Reports of primary destinations of about 30,000 cars in 1919–20 included shipments to 2,567 cities and towns, as itemized in United States Department of Agriculture Bulletin 935, "The Distribution of Northwestern Boxed Apples." A complete account of shipments diverted from first destinations would show many additional receiving points. The feature of recent seasons is the aggressive development of the small markets in the Central and Southern States. Table 10 shows distribution to many of the principal markets, June 1, 1923, to May 31, 1924.

Washington supplies most of the great eastern and midwestern cities with two-thirds to nine-tenths of their average boxed-apple receipts. Exceptions are Kansas City and St. Louis, which take only about one-half of their boxed-apple supply from Washington. Proportion of Washington apples in the boxed-apple supply reported in other large cities (1918 to 1923) ranges from 65 per cent in New York to 93 per cent in St. Paul. Altogether, distribution of Washington apples is thoroughly country-wide in its scope, because of the great volume of shipments and the aggressive methods of marketing practiced by the sellers.

Oregon finds its best market in New York, which takes 21 per cent of its average boxed-apple supply from that State, comprising one-fifth of the car lots shipped from Oregon, but including shipments for export. Chicago unloaded 550 cars of Oregon apples in 1923. Philadelphia, Boston, Kansas City, and St. Louis all consume much Oregon fruit.

Idaho averages yearly supplies of 222 cars to Chicago, 132 to New York, 118 to Kansas City, and 105 to St. Louis. Various western cities also are important markets for Idaho apples.

Only a few hundred cars shipped from the Rocky Mountain section reach eastern cities, although boxed McIntosh apples from the Bitter Root Valley, Mont., have an assured place in the New York market. Colorado and Utah ship comparatively few carloads east of Chicago, relying much on that city, St. Louis, Denver, and Kansas City. Wyoming carloads, few in number, go mostly to Kansas City and Chicago.

New Mexico ships to Chicago and Kansas City, and in 1923 entered the markets of Dallas, New Orleans, Memphis, and Denver. No receipts from Nevada or Arizona are reported among the unloads of the leading eastern and middle western markets.

The popularity of the California Gravensteins has increased shipments from California to New York and Boston. They totaled 587 cars to New York and 113 cars to Boston in 1923. Twelve large cities take an average of 1 to 7 per cent of their boxed apples from California.

Several of the larger southern cities each take about 40 cars a year. The home market is largest. Los Angeles takes about two-thirds of its car-lot supplies from California.

## SALES IN CITY MARKETS

The great majority of boxed apples is handled, like other car-lot produce, through brokers, by car-lot receivers, and in turn by jobbers and by retailers. Commission dealers may be regarded as car-lot receivers, and there are many other variations and combinations. Auctions combine some of the functions of receivers and commission dealers.

### THE BROKER

The broker is agent for the transaction between shipper or shipping association and dealer, or between dealer and dealer. It is his duty to represent the interest of the seller who may be far away from the distributing markets and to safeguard the interests of the buyer with an impartial service. He carries out the seller's instructions, informs him of the conditions at the marketing centers, obtains and submits offers from buyers and assists in adjusting disputes or complications which may arise, superintends the sale, obtains agreements and deposits, collects and forwards the proceeds.

### THE CAR-LOT DEALER

The car-lot dealer in boxed apples buys from the shipper through a broker or occasionally buys through his own agents in producing sections. He may resell through the regular fruit auction sales if located in large market centers, but generally he sells in less than car lots to jobbers. Sometimes his sales are made on track as the car is received, but in most cities sales are made from his store, often after a period of cold storage. Some concerns handle hundreds or even thousands of carloads yearly. In a few instances the concern has a large distributing organization which enables it to dispose of car lots or less to buyers throughout a wide consuming area. Sometimes these large distributors act as sales agents of cooperative associations, sales being made subject to confirmation by the association manager. A few of the large marketing organizations have their own brokers or employ traveling salesmen.

### THE JOBBER

The jobber buys usually in less than car lots mainly from car-lot distributors or at the auction sales and he resells in smaller lots of one box or more to retailers, hotels, and peddlers. The jobber's field is in the great market centers where the heavy receipts need quick handling and prompt distribution. His function is to connect the receiver and the retailer, neither of which has time or facilities for direct contact in trade. At the auctions also he obtains a profit as compensation for saving the time of retailers who can not come to the sale, inspect the goods, wait until the desired stock is put up for sale, and attend to the delivery of the purchase.

### THE COMMISSION DEALER

The commission dealer is less prominent in the boxed-apple trade than in handling some other lines of produce, but is responsible for a small percentage of business, including a considerable number of shipments from isolated or unorganized producing districts. Many firms have agents to solicit consignments at shipping points, often contracting with the growers to handle their crops. Sometimes when local prices are very low and cash offers unsatisfactory, shippers consign car lots at a venture. The commission dealers sell mostly to jobbers and retailers, charging the shipper usually 10 per cent commission.

Numerous variations exist in market practices. Many receivers will sell in lots of any number of boxes at prices varying according to the size of the order. A part of the stock may have been bought f. o. b. and some by auction or through another city dealer. In some large cities there is a fairly distinct class of small jobbers or small wholesalers. These dealers pay especial attention to small, out-of-town orders, advising the buyer on variety and brand, putting up the package securely for transportation, and attending to various details, perhaps extending long-time credit to regular customers. For these services an advance of 3 to 10 per cent over the ordinary jobbing price may be charged. In some markets there is a class of small jobbers called "wagon men," who peddle the fruit by the truck load, retailing it by the box to small buyers.

### A TYPICAL CARLOAD

The usual story of a car of boxed apples is that a broker, having received the description of the apples for sale by the country shipper or marketing organization, has called up the wholesalers on his list and obtained the best offer possible. This offer was wired to shipping point and as the terms were accepted, at first, or after the terms had been changed, the car was sold f. o. b. subject to inspection on arrival. The buyer pays the freight. Usually the car is billed to the shipper himself with instructions to the carrier to advise his broker or buyer at destination when the car arrives. When the broker or buyer pays for the car the shipper notifies the railroad to release the car to the buyer. On arrival of the car, the buyer or broker receives notice from the railroad, accepts the carload by paying the amount of invoice, and the buyer hauls the apples to his store in the wholesale district, where the salesman disposes of the apples in large or small lots.

Some cars are bought "Delivered" or "On track." Another variation is sale on commission, the shipment having been consigned by agents, branch offices, associations, and occasionally by individual growers.

### IN SMALLER MARKETS

In cities below half a million population there is usually no very distinct class of jobbers, but the car-lot receiver is also a jobber and perhaps a commission dealer selling lots of any size from a box to a carload. Sales in small lots constitute the great majority of the receivers' transactions in such markets and are the usual basis of their wholesale price quotations.

Many small markets are supplied from the most accessible large market direct by jobbers and small wholesalers, although in recent years the great distributing agencies in producing regions often negotiate through brokers or through traveling salesmen for direct car-lot shipments to places of 10,000 population, or even less. Sometimes a group of small dealers in such towns is able to combine in handling a direct car-lot shipment.

Efforts of producers to simplify the system have resulted in experiments with special plans, such as direct shipment of small lots to retailers or by parcel post to consumers, or the opening of city fruit distributing stores that sell boxes or baskets to consumers. Groups of small buyers or cooperative consumers' associations may buy car lots and distribute to members successfully, provided there are members with time and inclination to assume the considerable amount of detail and responsibility in such transactions.

Various special kinds of sales occur in the consuming territory close to the producing area where freight or express on small lots is not prohibitive and where the shipper may keep in close touch with buyers. Under such conditions he may sell direct to retailers or even to associations of consumers with whom he has established trade relations by mail or telegraph. The various details, difficulties, costs, and risks of trading in small lots and the relatively small number of consuming centers in the far West have prevented any great development of direct methods. The tendency has been rather toward the growth of very highly developed marketing firms or toward collective selling.

### THE RETAIL TRADE

Boxed apples are not handled by just the same class of retailers that sell most of the barreled fruit. The boxed apple is the favorite stock of the city fruit store, the fancy grocery, the corner fruit stand, the push cart, and other sales places which depend on display to attract buyers and which in the large cities supply the active demand for lunch and dessert fruit. Individual grocers, chain stores, and provision dealers also handle much boxed fruit, disposing of vast quantities when prices are on a competitive basis with barreled stock and local supply.

### BOXED APPLES AT AUCTION

At the regular auction markets of fruits and vegetables, boxed apples are sold in 14 cities. This auction centers are New York, Philadelphia, Baltimore, Pittsburgh, Boston, Cincinnati, Cleveland, Detroit, Minneapolis, St. Paul, Chicago, St. Louis, Newark, and New Orleans.

Local estimates of the proportion of boxed-apple arrivals sold by auction in the large cities vary from 25 to 30 per cent for Pittsburgh, Baltimore, and Chicago to over 90 per cent for St. Louis, Cleveland, and New Orleans. Philadelphia, Boston, Newark, and Detroit range from 60 to 75 per cent.

It is estimated that about 7,600 cars are sold annually at auction in nine great cities—New York, Philadelphia, Boston, Pittsburgh, Cincinnati, Cleveland, Chicago, St. Louis, and Detroit—or over 15 per cent of the average total of boxed-apple shipments. No figures

are available for sales in Baltimore, Newark, New Orleans, Minneapolis, St. Paul, and for occasional sales at other points. Probably the complete reports would show that close to one-fourth of the boxed-apple shipments are sold at auction.

Sales of northwestern apples are partly from current arrivals and partly from stocks placed in near-by storage. Auction supplies come mainly from brokers and car-lot receivers, with very few from country shippers' associations and from individual shippers and producers. Consignment for auction sale is usually made through a broker who acts as shipper's agent during the auction and perhaps withdraws the offering if conditions seem unsatisfactory.

A receiver when selling indirectly through an auction charges 5 per cent, out of which he pays 1½ to 2½ per cent, occasionally 3 per cent or more, to the auction company. Some associations maintain salaried agents to act as brokers, selling either to dealers or through the auction company.

The auction is held in the freight house, on the receiving pier, or in a near-by building, the stocks having been previously classified, labeled, and catalogued. Sales are based on packages taken at random from each lot in line, although the buyers rely much on their knowledge of the prominent brands.

The broker or the agent for the shipper represents the owner at the sale, preventing delays, adjusting disputes, giving information to buyers, observing the proceedings, and, in general, protecting the owner's interest. A car lot is sold in 2 to 10 minutes. The shipper receives a catalogue of sales made. The fruit is sold in lots of 10 packages upward in the smaller cities, and from 40 packages upward in the greater markets. The larger buyer may assign a part of his purchase to others whose requirements are small. Buyers include jobbers, commission dealers, motor-truck wholesalers, chain stores, grocers, hotels, and peddlers. The buyers pay for cartage. Perhaps 20 per cent of the sales are to "buying brokers" who buy on commission, usually 5 cents a package, acting for persons who do not care to spend time to attend the sale.

Jobbers are heavy buyers at auctions and in some cities they take two-thirds of the sales. Jobbers expect to sell at a profit of 5 to 25 cents per package over auction prices. Sometimes the difference between auction and jobbing prices is very considerable, but it is asserted that the tendency of auction selling is to cut down the margin obtained by receivers and jobbers.

Among the advantages claimed for the auction system of disposal are (1) competitive bidding from a large number of buyers together, (2) prompt disposal of all classes and grades of stock, (3) publicity of prices paid, (4) less deterioration of stock, and (5) more or less saving in cost of selling.

## LEADING BOXED-APPLE MARKETS

The boxed-apple markets, aside from geographical location, are of three general classes. First are the home markets of the boxed-apple region where practically all receipts are from boxed-apple States. Because of seasonal demand and market preference, these supplies are not necessarily all from the home State. In 1923 Denver took nearly half of its supply from shipping points not in Colorado.

In another class of boxed-apple markets the greater part of the receipts is from the boxed-apple States, and boxed apples are the market leaders, although not without competition from the nearest barrel regions. These markets are in the North Central and South Central States and include St. Paul, Kansas City, Omaha, and leading cities of Texas, Alabama, Mississippi, and Louisiana.

A third class comprises the strongly competitive markets where the barreled-apple regions ship more than half the average number of car-lot unloads. These include most large markets eastward from Chicago and St. Louis. In seasons when the boxed and barreled apple supplies are abundant and fairly equal in total car-lot movement, the number of unloads of boxed apples sometimes exceeds those of barreled stock, even in Chicago. In Milwaukee and Detroit, although a boxed-apple State is the leading single source of supply for both cities, their combined receipts from the barrel region are greater than those from the box sections.

Markets of the Pacific coast and the Rocky Mountain region are supplied from the boxed-apple region. Eastern cities, from Chicago to the coast, are mostly close to barreled-apple regions and use more eastern than western apples. Markets in the upper Mississippi Valley and in most parts of the South are distant from the main apple regions and are competing ground for both classes. From Kansas City southward most markets take more boxed than barreled stock. In 1923 when both classes were in liberal supply, southern boxed-apple markets included New Orleans, Dallas, and Birmingham, while a tier of markets from Washington down to Atlanta received more carloads of barreled than of boxed apples. The capture of many southern markets by the boxed apple is a notable recent development.

Comparison of boxed and barreled unloads in the following discussion of city markets is based on total car lots received during the calendar years 1918 to 1923, as shown in Table 9. The better to illustrate proportions and comparisons with total State shipments, the unload maps are presented, where the average of the crop years 1918–19 to 1923–24 is used and car lots reduced to bushels on the basis of 756 bushels to a car of boxed apples and 525 to a car of barreled.

Arranged according to geographical location, the markets may be conveniently classified as eastern, midwestern, southern, and western.

## FEATURES OF CITY MARKETS

### EASTERN

#### NEW YORK

The States of Washington, Oregon, California, Montana, and Idaho, chiefly supply New York City with boxed apples. The State of New York in the barrel region leads in the total supply, and apples arrive from one or more of these States practically throughout the year. Relative quantities of receipts from the principal eastern and western sources are shown in Figure 18.

Boxed apples are sold on the railroad pier directly or are sold at auction and bought by jobbers, large retail grocers, push-cart ped-

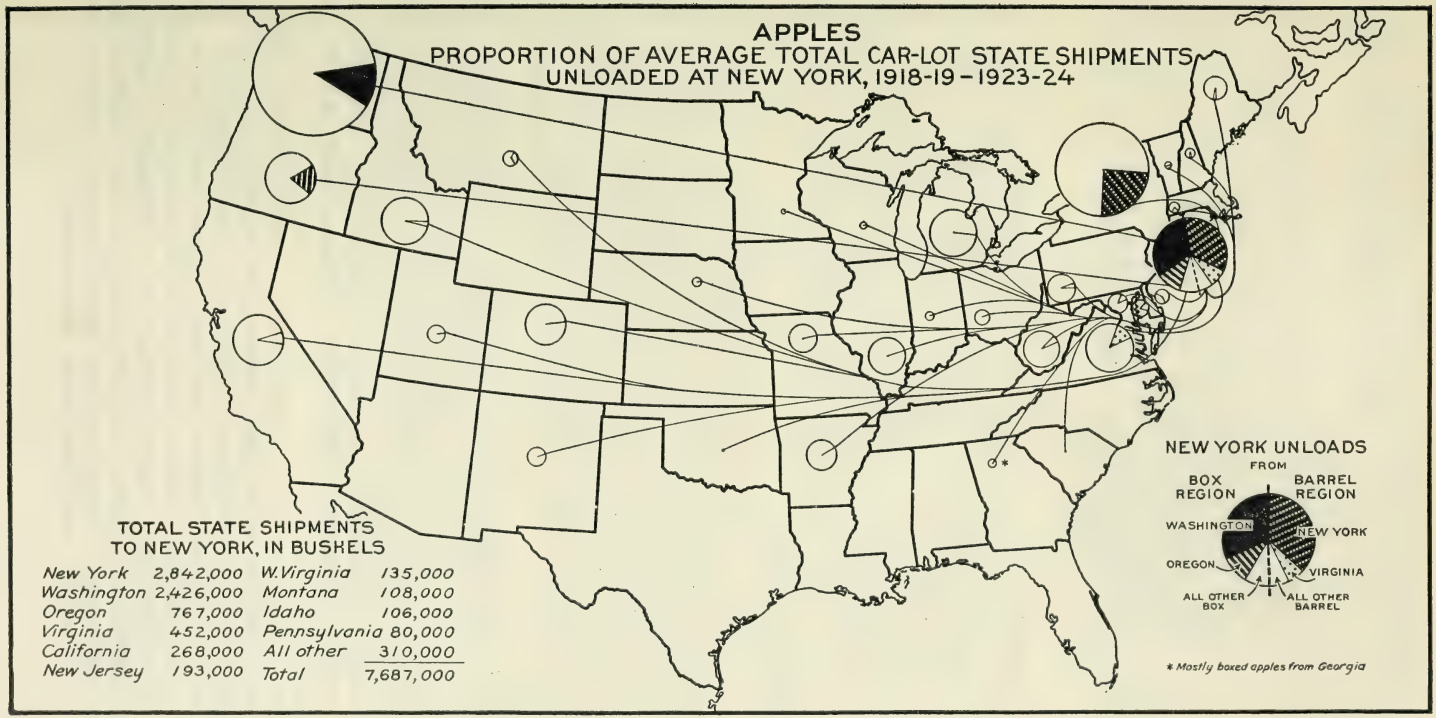


FIG. 18.—Western boxed apples form one-half the total car-lot supply in New York City. Boxed apples from Washington and barreled apples from New York constitute over two-thirds of the receipts

dlers, and fruit-shop buyers. The jobbers occasionally buy straight carloads from the receivers at private sale, but usually the unit ranges from 10 to 50 boxes. Two or three large dealers specialize in boxed apples, but even these dealers handle a few other lines of produce during the off season.

Large sizes are generally preferred by the boxed-apple jobbing trade in New York and bring a premium in most instances. Exceptions are the McIntosh and Jonathan varieties for which the principal demand is in medium and small stock. The best grades from all sections meet the best demand, Fancy stock under normal conditions selling about 50 to 75 cents lower than corresponding sizes of Extra Fancy and C grade proportionately lower than Fancy. Delicious, Spitzenburg, Winesap, McIntosh, and Yellow Newtown are the favored varieties.

BOSTON

This market receives western boxed apples from Washington, California, Oregon, and Idaho, and for the last few years from British Columbia. Of the receipts from the four States, Washington supplies nearly 85 per cent, California 7, Oregon 6, and Idaho about 3. Although located at the eastern end of the barreled-apple region, Boston receives almost as many car lots of boxed as of barreled apples, but the local stock received in smaller lots is an important feature. Over a period of four years, 1920 to 1923, 44 per cent of the total cars received at Boston originated in the western boxed-apple region (fig. 19).

Consumption of boxed fruit has increased, especially of the medium to late varieties such as Stayman Winesap and Winesap. Early western box varieties like the Jonathan have not done so well in the market of late years because several districts within 50 miles of Boston produce large crops of fine-quality McIntosh, which are put up in standard bushel boxes, tier packed, and sometimes wrapped, making a very attractive package. As McIntosh is an early kind it cleans up quickly. After this variety is gone there is always an increased demand for Stayman Winesap, Esopus Spitzenburg, and Winesap.

Boston is a red-apple market. Yellowish varieties such as Yellow Newtown, Ortley, Bellflower, and White Pearmain meet with only a limited demand. For apples of really high color this market will pay high prices, but poorly colored stock goes mostly to the peddler trade. The following varieties lead: Winesap, Stayman Winesap, Jonathan, Rome Beauty, Delicious, and Esopus Spitzenburg. Native boxed apples include Baldwin, McIntosh, Williams, Gravenstein, and Northern Spy.

Boston usually receives a fairly heavy supply of the California Gravenstein, which is the first western boxed apple to arrive and encounters little competition. This variety is followed by large quantities of Middle Atlantic and local apples which prevent the receipt of any further western stock until the Jonathan is ready to ship. In a year of light local production of the McIntosh, this market consumes large quantities of the Jonathan, but not so when there is a heavy local crop. Of the so-called "good keepers," comparatively few of the Black Ben and Ben Davis are received.

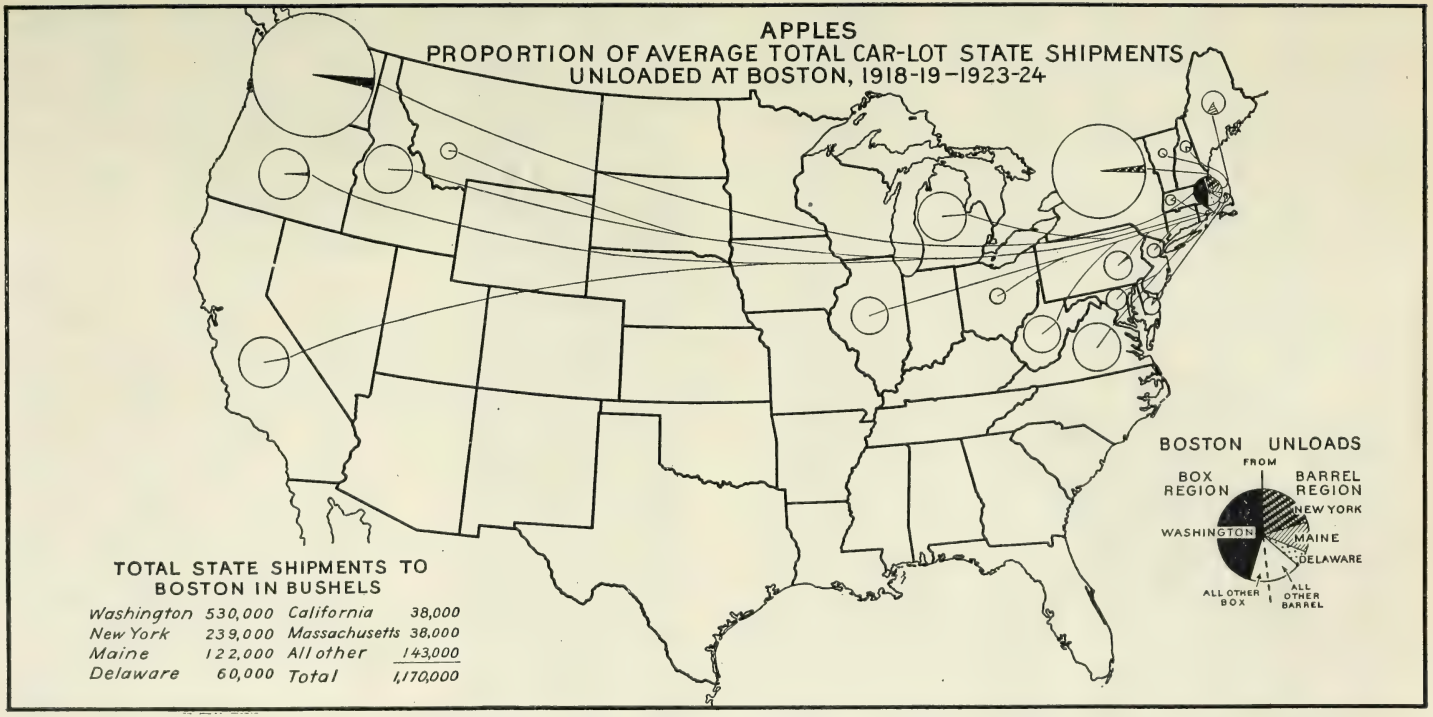


FIG. 19.—Washington apples unloaded in Boston amount to nearly one-half the total car-lot supply

PHILADELPHIA

About 65 per cent of the boxed apples received at Philadelphia are sold at auction. Car-lot receivers sell to jobbers or to any large buyers. Monday and Thursday are most active market days. The boxed-apple supply begins with California Gravenstein, followed by Northwestern Jonathan, Delicious, Stayman Winesap, Yellow Newtown, and Winesap. Red varieties in general are preferred.

The Extra Fancy grade meets the best demand. The demand for different sizes varies considerably with the season and with the variety of the apple. As a rule, large sizes are preferred. After the 100 and larger sizes are moved, the 150s and 163s are usually the next in demand. Demand for 125s and 138s varies, sometimes being better than for the 150s and 163s and sometimes not so good. The large sizes, especially of Stayman Winesap and Delicious, are always in demand by the fancy fruit stands. As they command an exceptionally high price and as the supply of these sizes is seldom heavy, they bring a decided premium. The demand for yellow varieties is limited, but receipts of two or three cars a week of this stock meet a fairly good demand, especially for the 100s and larger.

Less than one-half of the number of cars unloaded at Philadelphia come from the boxed-apple region, and of these 90 per cent are shipped from Washington. Other States that contribute small quantities each season are Oregon, California, and Idaho. The map, Figure 20, shows relative supplies from all principal contributing sources of both boxed and barreled stock.

BALTIMORE

Most of the boxed apples received at Baltimore are from Washington and Oregon, with a few cars from California and Idaho and some in less than car lots from Maryland, Virginia, and Pennsylvania. About one-fourth of the western stock is sold at auction, the remainder at the railroad yards, principally in a jobbing way. A few car-lot sales are made to out-of-town buyers. The principal box varieties in demand are Stayman Winesap, Grimes Golden, Rome Beauty, White Pearmain, Esopus Spitzenburg, Winesap, Yellow Newtown, Delicious, and Jonathan in about the order named.

WASHINGTON

Practically all arrivals of boxed apples at the two railroad terminal yards have been purchased in advance by the receivers. No sales are made at the yards. The apples are trucked to the wholesale section near the business center, or are taken to the cold storage. A few of the larger retail dealers, who are small jobbers, may buy certain choice lots from a car and store them for short periods, but the bulk of the storage stock is owned by the wholesalers. Most of the boxed apples are sold in very small lots to the retailers as there is no distinct jobbing class of dealers.

Of an average of over 500 cars unloaded annually at Washington from 1918 to 1923, about 35 per cent originated in the western boxed apple region. Of the boxed supplies, Washington forwarded, nearly nine-tenths, and Oregon, California, and Idaho together made up the remaining one-tenth.

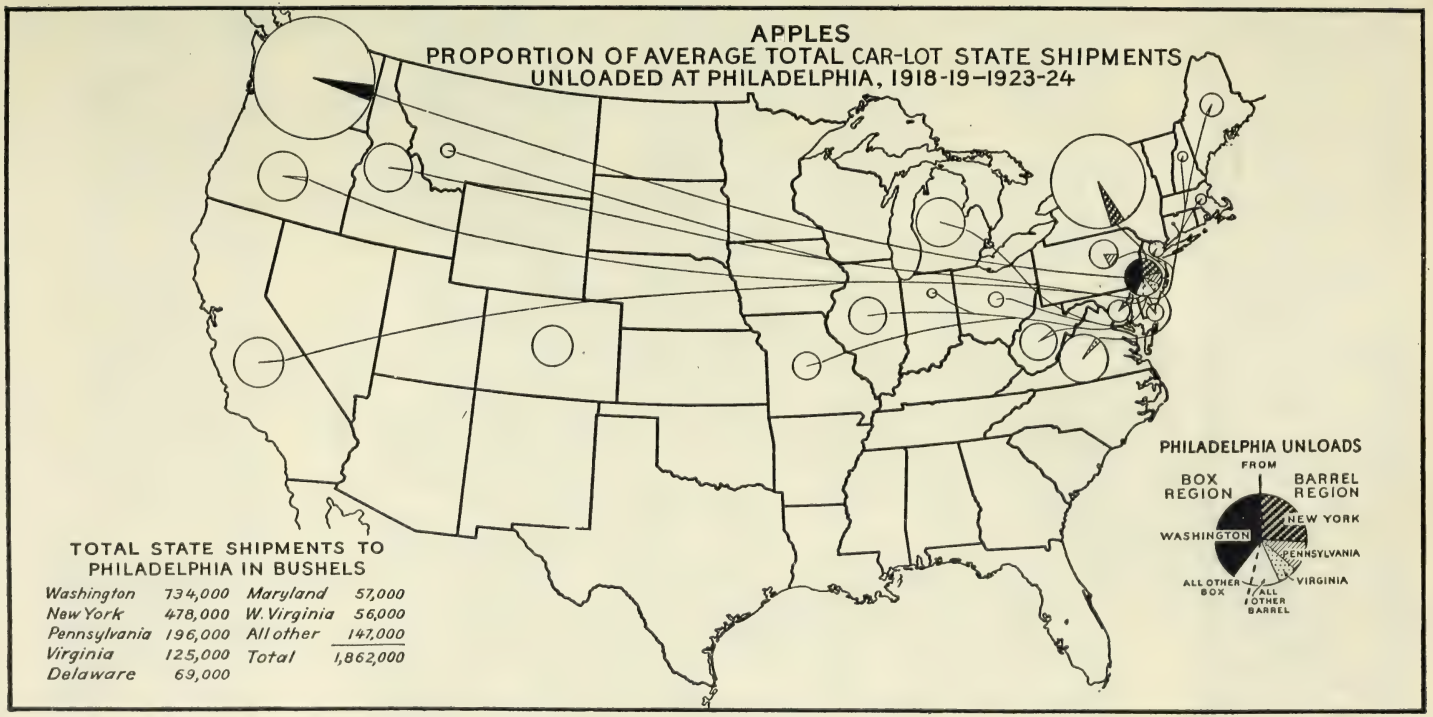


FIG. 20.—About 90 per cent of the western boxed apples unloaded in Philadelphia come from Washington

Under ordinary conditions, most dealers prefer to lay in their supplies for the season during October and November, and comparatively little fruit is received after that time. Practically all of this stock is immediately placed in storage and taken out as required. The most popular table varieties of boxed apples are the Delicious, Esopus Spitzenburg, Stayman Winesap, Winesap, and Rome Beauty, but the yellow varieties also sell readily. The larger sizes of all varieties are in demand. Stock of poor grade and secondary quality is in light demand in this market and usually is sold at a heavy discount.

#### PITTSBURGH

Two general methods of selling boxed apples prevail in the Pittsburgh market. About 75 per cent of the sales are made direct by the receiver to the jobber or wholesaler, and about 25 per cent through the auction. Private sales by receivers usually are made directly from cars, though more boxed apples are unloaded on arrival and stored than is customary with other lines of produce.

Most receivers have storage facilities and can store stock if the movement from cars is too slow to allow arrivals to be disposed of promptly. One of the larger houses makes a practice of selling its entire supply through the store, offering no stock for sale from the cars. Usually prices obtained at the stores are slightly higher than yard prices, although the difference is largely offset by cost of drayage and handling.

About one-fifth of the 2,800 cars of apples unloaded at Pittsburgh annually, come from the boxed-apple region. Heavier loading of boxed apples brings the proportion in actual quantity to slightly over one-fourth (fig. 21). Of these supplies Washington forwards 85 per cent or about 500 cars, Idaho, Oregon, California, and Colorado make up the additional 15 per cent, bringing the total receipts close to 600 cars of boxed apples per year.

Towns within a radius of 50 to 75 miles draw on Pittsburgh for their supplies. The demand for boxed apples is good during almost the entire season, in spite of the fact that heavy shipments of barreled stock are received from neighboring States. Dealers in surrounding towns usually buy less than carload lots, although a number of carlot sales are made. The most popular varieties are Delicious, Esopus Spitzenburg, Jonathan, Winesap, and Rome Beauty. The favorite sizes are from 72 to 150 per box.

### MIDWESTERN

#### CHICAGO

Approximately 2,700 cars, or 40 per cent of the total number unloaded, are drawn from the western boxed-apple region. Washington supplies three-fourths of the boxed unloads, Idaho about one-twelfth, and Oregon and California together, one-tenth. Colorado ships around 100 cars annually to this market, and small quantities are received from each of the other leading boxed-apple States. Comparative sources of boxed and barreled supplies in this market are shown in Figure 22.

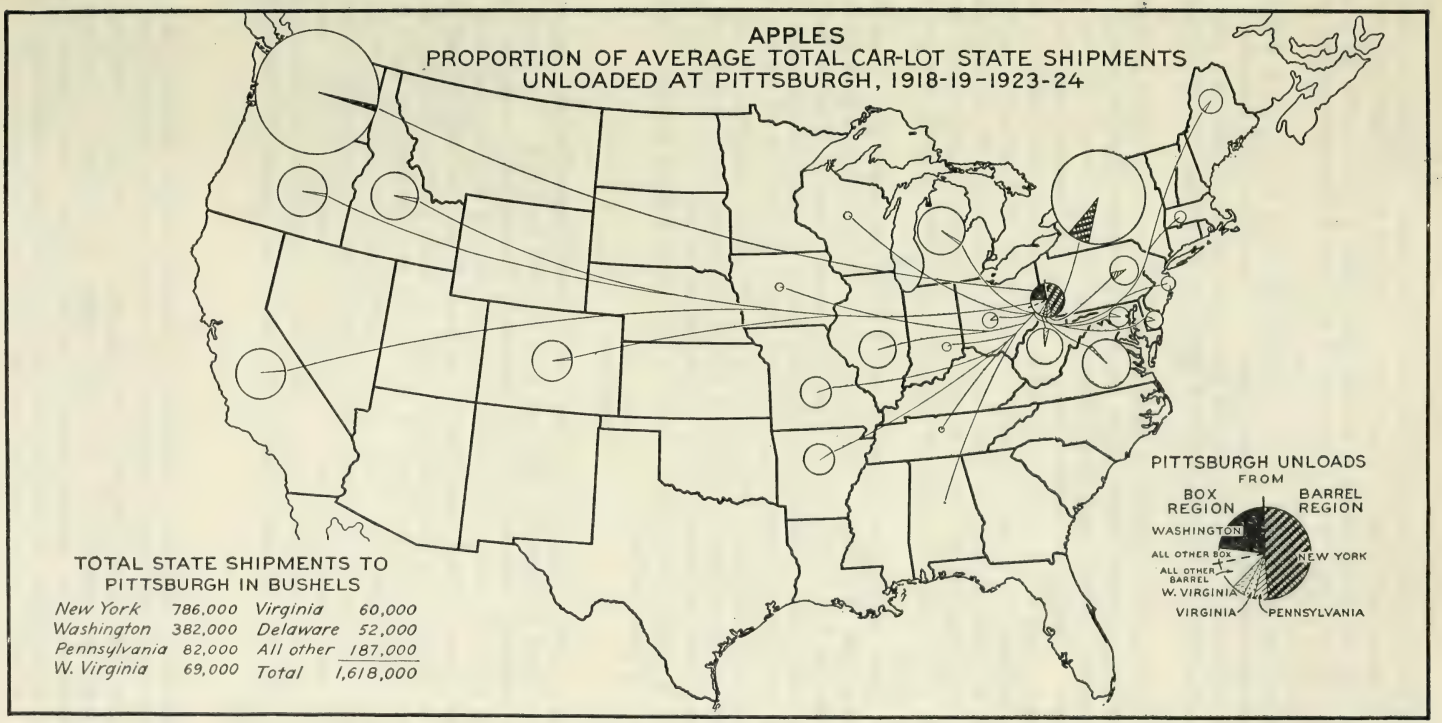


FIG. 21.—The western boxed apple region furnishes about one-fourth of Pittsburgh's total car-lot supply

Chicago is an important distributing center and supplies most of the apples consumed within a radius of 100 miles. There are some 10 or 15 houses that make a specialty of selling to dealers and storekeepers in the surrounding towns; and, during the season of boxed apples, it is seldom that a shipment of any size to these outside points is without at least a few boxes of apples.

During the past few years Chicago dealers have tried hard to increase consumption of boxed apples. Undoubtedly the demand has gained materially. Storekeepers have played an important part by advocating buying whole boxes of apples rather than the usual pound or two.

A large car-lot business is transacted here, usually from broker to large wholesaler or jobber, after which the cars are jobbed out to the commission houses, and from these pass to the retail grocers and peddlers. Nearly all dealers have stores in the market district, and although they may call themselves commission merchants, wholesalers, jobbers, or what not, nearly all of them do a certain amount of selling to retail grocers or peddlers. The peddlers are an especially convenient means of working off stock that will not keep much longer. The auction business constitutes approximately 30 per cent of the total.

The three leading varieties in order of importance are: Jonathan, Winesap, and Delicious. The last-named variety would undoubtedly head the list but for the fact that it is usually nearly twice as high in price as the other varieties and this naturally curtails the consumption.

The boxed-apple market lasts from about the middle of September, when the California Gravensteins make their appearance on the market, until around the first of June, the latest varieties being the Winesap and Delicious. The desirable sizes are 80s to 150s, with usually a preference for the Fancy and Extra Fancy grades. The C grade is a poor seller.

### CLEVELAND

Boxed stock formed 28 per cent of the total cars of apples unloaded at Cleveland during the six-year period 1918 to 1923. As in several other markets, eastern and midwestern, Washington supplies 80 to 90 per cent of the total boxed receipts which average around 440 cars per year. Heavy shipments are made from the near-by barreled-apple sections, largely from the State of New York. During recent seasons, at least 90 per cent of the boxed apples received have been marketed at auction. One of the brokers has estimated that an average of 15 to 25 per cent of the boxed apples sold at the auction goes to out-of-town buyers. Very few are bought by the receiver and jobbed in local lots, as the stock can be purchased at the auction as cheaply or even more cheaply at times than the receiver can afford to sell it.

### CINCINNATI

Cincinnati has been considered a barreled-apple market, but the western apple, probably because of its more convenient package, the care exercised in grading and packing, and its general attractiveness, is gaining in popularity. In 1918, using the carload as a basis of computation, the consumption of boxed apples approximated one-fifth that of those in barrels, but in 1923 the proportion was three-

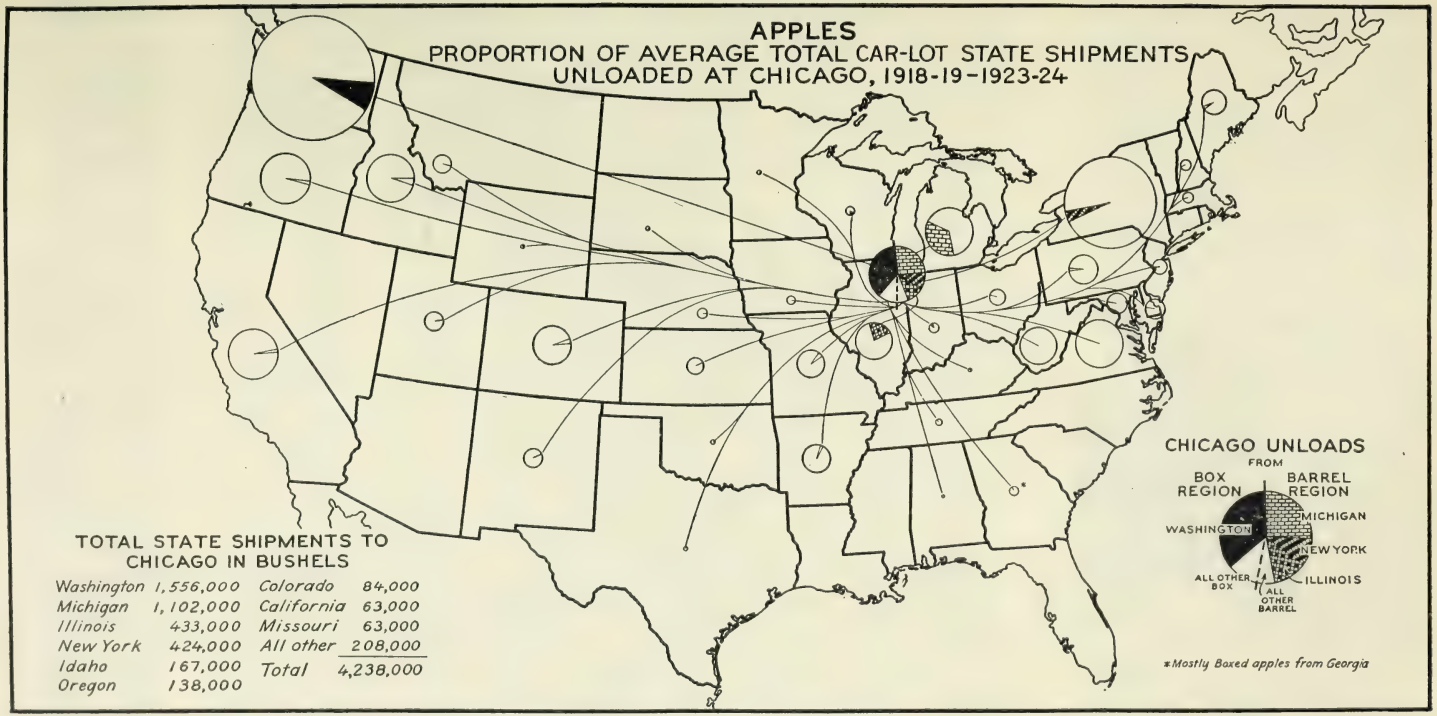


FIG. 22.—Nearly one-half the car-lot quantity of apples unloaded at Chicago comes from the western boxed-apple region

fifths. Barreled receipts remained fairly steady throughout the period, whereas boxed receipts were more than three times as numerous in 1923 as in 1918. Increased shipments from the State of Washington account for most of the gain. At least 75 and possibly 85 to 90 per cent of the boxed apples arriving are sold at auction and the remainder are jobbed at the team tracks or placed in storage.

A seasonal preference is shown for certain varieties and sizes. Jonathan, Rome Beauty, Winesap, and Delicious probably rank first, with Grimes Golden and Yellow Newtown following close behind. When red and yellow varieties are on the market, the preference is shown for the red. When the apples are arriving in good condition, 100s, 113s, 136s and 150s, or in other words, the medium to large sizes, bring the best prices, but later in the season the popular favor swings to 163s and smaller sizes.

### ST. LOUIS

Total unloads of apples at St. Louis average around 2,000 cars annually and nearly one-third of these cars originate in the western boxed-apple region. Idaho and Colorado are prominent sources of boxed supplies after Washington (fig. 23). Proportions of boxed and barreled stock vary widely from season to season, however. During 1921–22 over two-thirds of the apple supplies at St. Louis came from box sections; in 1922–23 only about one-fourth came from the boxed-apple region and the other three-fourths were supplied principally from Calhoun County, Ill., and from Missouri.

From this it is seen that boxed apples, under ordinary conditions, meet strong competition. During seasons like that of 1921–22, when the boxed stock is practically supplying the market, the stock is sold in a jobbing way and on the auction, with the price running fairly close for each method of marketing. Under such conditions, the jobbing of boxed apples is no more difficult than of any other commodity. Given a return to normal weather and crop conditions for the surrounding territory the marketing of boxed apples in St. Louis assumes almost the opposite appearance. That is to say, the principal sales of boxed stock are then made through the auction, and jobbing sales are few and far between. Western boxed apples are all received by rail, and the various transportation companies that maintain team tracks for unloading have their yards from three or four blocks to as far as 3 or 4 miles from the produce market section, where the stock is sold.

Regardless of where it may be unloaded, the stock is hauled to "the street" where it may be inspected by the prospective buyer, and if it is found to suit his needs it is then hauled to his place of business and unloaded. The boxed apples most popular, named in order of volume consumed, are Winesap, Jonathan, Ben Davis, and Delicious.

### KANSAS CITY

Because of its location, Kansas City, Mo., is used to a great extent as a car-lot diversion point by fruit and vegetable shippers in the South, the West, and the North. Recent figures over a limited period show that over three-fifths of the car-lot arrivals of apples at Kansas City were reshipped to other points.

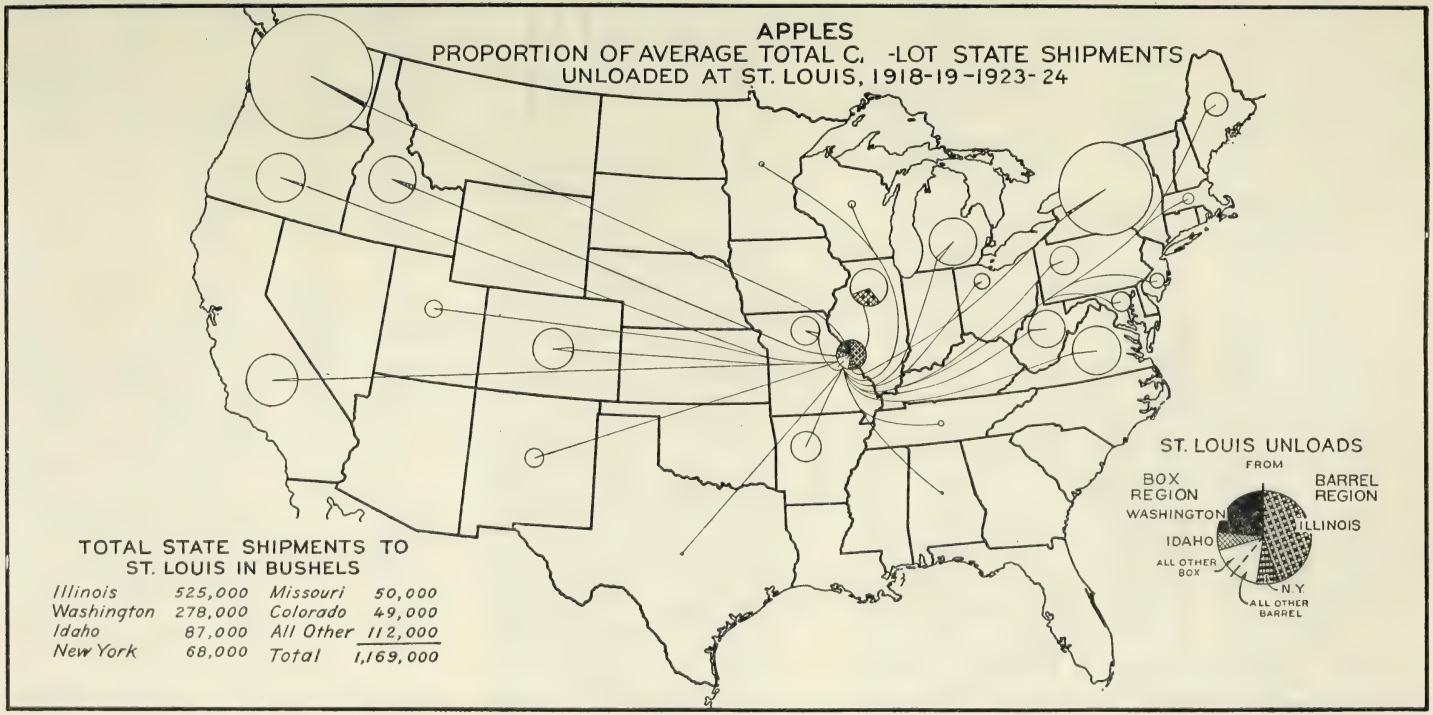


FIG. 23.—St. Louis is principally a barreled apple market, but usually receives one-third of its car-lot supply from the western boxed-apple region

During the six-year period, 1918 to 1923, nearly two-thirds of the cars of apples unloaded in this market were from the western boxed-apple region, including supplies from all the leading shipping States. As with the St. Louis market, Idaho and Colorado are important sources. These two States, with Oregon, average together as many cars as Washington, and the four States named forward over 90 per cent of the city's total boxed supplies. Relative sources of total boxed and barreled supplies at Kansas City are shown in the map, Figure 24.

Every railroad that enters Kansas City has a team track where fruits and vegetables may be unloaded but only one road has trackage in the wholesale-produce district. For this reason, many cars are transferred to that road for unloading, thus saving a long haul across town by truck.

The larger firms buy most of their apples on advance orders, depending on cars in the hands of brokers to fill in any shortage. Many small dealers buy almost exclusively from brokers who do a considerable volume of car-lot business on the Kansas City market, acting in behalf of shippers and operating on either a percentage basis or a straight commission of $15 or more per car. Brokers' sales are usually made in car lots but some car lots are broken into large lots for the convenience of dealers.

### MINNEAPOLIS AND ST. PAUL

Car-lot unloads of apples in Minneapolis and St. Paul from 1918 to 1923 indicate a preference for western boxed stock. During these six years, boxed apples averaged over one-half the total cars unloaded at Minneapolis and about two-thirds of the number unloaded at St. Paul. About 90 per cent of the boxed apples come from Washington. Jonathan and Delicious are popular varieties, and a preference is reported for Extra Fancy in sizes ranging 113 to 150. Both cities have large cold-storage facilities where many apples are stored in transit. Receipts are usually sold direct in small lots by the wholesalers to retailers. Demand for boxed stock in many small towns in adjoining States is supplied by dealers in these cities.

### MILWAUKEE

Boxed apples sell readily in Milwaukee, for there is a brisk demand for the better grades throughout the year, especially for the red varieties.

The wholesale market is conveniently located about half way between the principal railway freight terminals, and adjacent to the larger ship-line docks.

Though situated near to Chicago, the local market does not follow closely the frequent fluctuations in prices on that market. There is a steady local demand, and little or no speculating, for the merchants buy to supply their own requirements.

The first boxed apples to appear on the market are California Gravensteins which arrive the latter part of June. Fall and winter apples are drawn from the western and northwestern States. The following varieties lead in importance: Jonathan, Grimes Golden, Wagener, Yellow Bellflower, Winesap, Stayman Winesap, Rome

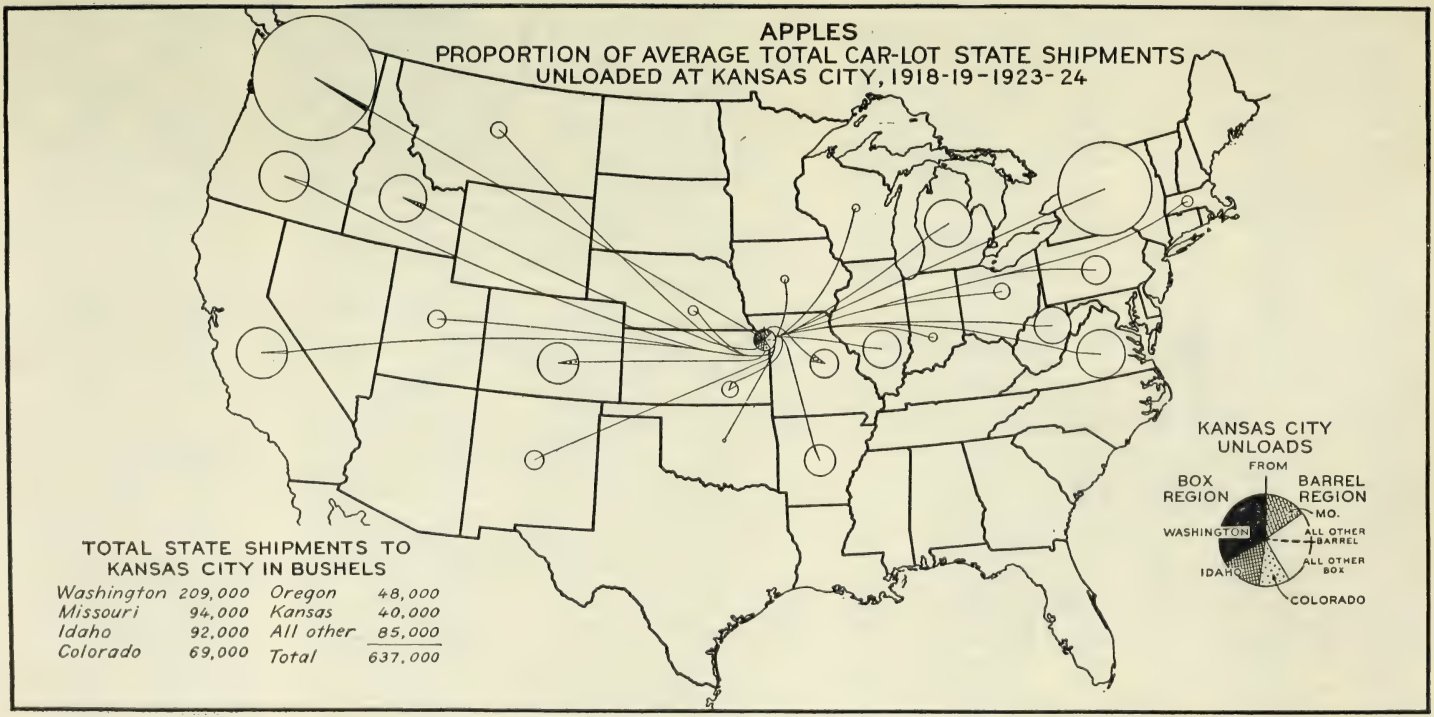


FIG. 24.—Idaho, Colorad o, and Oregon, in addition to Washington, are prominent in the boxed-apple supply of Kansas City

Beauty, Delicious, Esopus Spitzenburg, White Pearmain, Winter Banana, Yellow Newtown, and Ben Davis.

A comparative statement of apple stocks on hand in Milwaukee, both in common and cold storage, shows the rapid gain in popularity of boxed apples over barreled stock in this market during the past few years: On March 1, 1915, there were 16,200 barrels and 8,500 boxes on hand. On March 1, 1923, the available stocks comprised 9,000 barrels and 70,000 boxes.

## SOUTHERN

### NORFOLK

In boxed apples, the bulk of the movement is of the Fancy grade. Only a small proportion of Extra Fancy boxed apples is used in Norfolk. Usually barreled fruit supplies the bulk of the trade, except in years when the Virginia crop is light or of low quality. At such times boxed apples are used in larger quantities, if they can be obtained at profitable prices. In these years the supply of barreled apples usually is procured from New York and Ohio points, though when fair-quality Virginia apples are available they are preferred. The produce trade in Norfolk supplies the cities of Norfolk and Portsmouth and near-by territory in southeastern Virginia and eastern North Carolina.

### ATLANTA

In 1923–24 there were unloaded in Atlanta 554 cars of apples (Table 10), of which 218 came from the western boxed apple region. Washington alone forwarded 189 cars, and California, Oregon, and Idaho made up the balance of the boxed supplies. Most carloads that arrive in Atlanta are split up between several jobbers, or are stored by the receivers to be distributed as needed, in lots of 5 to 50 packages. Many small towns within a radius of 100 to 150 miles draw on Atlanta for their apple supplies. These are shipped out by local freight, or occasionally by express. Practically no mixed cars are loaded and shipped from this point. The principal sizes and grades in boxed apples are 113s and smaller, Fancy and C grade, with a few Extra Fancy. Home-grown stock is usually "jumbled" in boxes and much is stored to be drawn upon later when supplies from other sections are cleaning up. Not all sales are made through regular channels; a few cars are held and sold on track to peddlers and other trade, particularly around the holidays. Much of the stock sold on track is of only fair quality or is in poor condition.

### NEW ORLEANS

New Orleans is a somewhat typical southern market in its dependence in shipped-in supplies, preferably red varieties. Even the rather ordinary varieties, Ben Davis and Arkansas Black, seem more in favor than choice yellow kinds like Grimes Golden and Yellow Newtown. The boxed Delicious is becoming very popular in this market, as elsewhere, and boxed Jonathans and Winesaps are standard. Of 636 cars unloaded at New Orleans in 1923–24, 419 were of boxed apples, Washington alone having shipped 249. California,

Colorado, Idaho, New Mexico, and Oregon also contributed in lesser quantities. Auction sales prevail to a remarkable extent. Perhaps 95 per cent of the total receipts are disposed of in this way.

#### HOUSTON

Houston, Tex., is a boxed-apple market with practically no barreled or home-grown supply. The receipts are about half northwestern boxed Winesap. Next in importance are the Arkansas Black and Ben Davis from various sources, then the Jonathan and Rome Beauty from Idaho. Extra Fancy and C grade are popular. There are early supplies from California, New Mexico, northern Texas, and Oklahoma.

### WESTERN

#### OMAHA

Practically all of the apples handled by wholesalers in Omaha are bought outright from growers or from distributing organizations or their local representatives. Boxed apples are especially preferred in this market. Most of the supply comes from Washington. In 1923–24 that State contributed 328 cars of a total supply of 725. Oregon shipped 115 and Idaho 124.

#### DENVER

Boxed apples from California, Washington, Oregon, and New Mexico, as well as from the nearer apple sections of Colorado, Idaho, and Utah, are received in Denver Colo. The summer supply comprises basket stock from Colorado and boxed apples from California. Practically no barreled apples are received. Other varieties, such as Wealthy, Jonathan, and Grimes Golden are marketed in boxes and baskets about equally. The winter kinds are in boxes. Denver is distinctly a red-apple market. Delicious and large well-colored Rome Beauty are especially popular. The trade is handled by receivers, who do also a jobbing, wholesaling, and commission business.

#### PORTLAND, OREG.

In proportion to its population, Portland, Oreg., is a large consumer of apples. Residents bring them from near-by orchards for themselves and friends; many have rural connections and get a few boxes in by truck; hawkers buy job lots of off-grade stock from the packing houses and canvass the city with them; out-of-town men often come in for the winter and open a store exclusively for apples, and there is the regular trade handling mostly off-grade or off-pack stuff sent them on consignment.

During July and August a few cars of Gravensteins are brought in from California, but the main sources of supply are Willamette Valley and the mid-Columbia sections of Hood River, Oreg., and White Salmon, Wash. Supplies move into the city mostly by truck or boat. The wholesalers have some trade in nonorchard sections, but do not get a large part of the city business, for every groceryman has producers ready to supply him, sometimes among his own customers.

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The Jonathan, Esopus Spitzenburg, and Yellow Newtown are most used here. Probably the Jonathan is the most popular, but its short season prevents it being the biggest seller. The Esopus Spitzenburg leads, because it is produced in large quantities and possibly in its greatest perfection in this section. It is the chief red winter market apple here, the Winesap being mostly shipped east to await high prices in the spring.

### SPOKANE

Fully 75 per cent of the demand is supplied from neighboring orchards. As in most other producing sections, the best fruit is shipped to large markets and the poorer stock retained for local consumption. The volume of business from receivers direct to retailers is comparatively small, because retailers buy so much stock directly from the growers. Receivers do, however, have a trade in districts where no apples are grown. The receivers are located along the railroad track with sidings next to their warehouses, so that there is no cartage from the car.

### SACRAMENTO

The apple supply of Sacramento is mainly California stock with some shipments of standard kinds from Washington and Oregon. Receipts are bought outright through brokers or associations. Oregon Esopus Spitzenburgs, and Washington Winesaps are favorite stock. Best selling grades are Extra Fancy and C grade, and favorite sizes 138 or larger.

### LOS ANGELES

About half the apple supply of Los Angeles is received from northern California districts. Other leading sources are Utah, Washington, Oregon, and Idaho in the order named. A large local supply comes from the nearby districts of Beaumont and Yucaipa. Washington and Oregon apples are generally wrapped and packed; Idaho and Utah stock is usually received loose in boxes faced and filled, or in bulk. Washington ships the Jonathan, Delicious, Yellow Newtown, and Winesap. Oregon supplies mostly Esopus Spitzenburg, and Yellow Newtown; Idaho and Utah ship chiefly Jonathan with a few Delicious. The northern California sections ship principally Yellow Newtown, Yellow Bellflower, and Gravensteins to Los Angeles.

Car-lot receivers in the Los Angeles market buy direct from shippers or through local brokers. Very few sales are made rolling and northwestern shippers generally do not ship to Los Angeles except upon orders. Los Angeles is practically the end of diversion for Northwest shippers, as apples going east of Los Angeles take a combination of freight rates. The northern California shippers have an advantage in that they can divert out of Los Angeles to certain eastern points, and they frequently roll cars into Los Angeles unsold. This is probably an important reason, together with the lower freight rates, for the heavy consumption of California apples in this market.

A great many apples are placed in cold storage in Los Angeles in the fall for winter and spring consumption. Northwestern apples are usually stored by receivers and the California stock by shippers.

Idaho and Utah apples are usually orchard run. Northwestern boxed apples are Extra Fancy and Fancy, with the market preference for the Fancy grade. Very little C grade stock is sold, except Delicious.

### SAN DIEGO

Very few apples of Extra Fancy grade are used in San Diego, as the trade will not pay the price which must be obtained for this grade of stock. There are as many of C grade sold as of Fancy. Practically all the home-grown stock is sold loose in boxes, orchard run. The proportions from different sections are estimated as follows: Home grown, 10 per cent; Beaumont section, 15; Watsonville, 35; Sebastopol, 5; Northwestern, including Utah, 35 per cent. Utah apples are a large factor in some years and practically negligible in others. Local cold storages report 86,102 boxes stored during the season of 1922–23. This is probably about half the total number sold here, which would make the capacity of the market about 170,000 to 180,000 boxes a year. Nearly all sales are direct to retailers.

### SIZES AND GRADES

As a rule, the markets prefer the medium to large sizes, ranging from 138 to 88 apples to the box. There is a fair to good demand for very large sizes for display purposes and for the large sizes of Rome Beauty for baking. For the larger apples, retailers find difficulty in obtaining prices that show a profit equal to that on medium sizes. Small sizes are wanted for export trade and for the general market, also late in storage season or when prices are high and the retailers are looking for fruit which may be sold at 5 cents or less.

Extra Fancy and Fancy grades are reported the most popular everywhere except in western markets near sources of supply where an abundance of low-grade or ungraded stock restricts the sale of top grades. Large markets reporting special demand for C grade are all in the West and Southwest, and none in the barreled-apple region.

### LOW GRADES AND HOME GROWNS

It is often contended that apples below Fancy should be kept away from distant markets, because usually they yield little return over the cost of marketing and tend to restrict and cheapen the market for higher grades. The argument becomes stronger with the advance of freight charges in recent years and the increased production of boxed apples. Probably the development of local markets and the rapid increase in the use of western apples in the manufacture of by-products will eventually tend to restrict distant shipment of low-grade fruit, apart from any cooperative effort in that direction.

For a few varieties, the Delicious in particular, there is a large demand for the C grade. On account of the higher level of cost for such kinds, this grade is often the only one which can be offered consumers at low prices. In such varieties the large sizes of C grade are very good sellers. Apples of this grade are not very well colored and some may be poor also in flavor, because grown on inside branches or in crowded orchards or otherwise without the full benefit of the sunshine; but, when possessing the general style of a favorite, they often meet a good demand.

Naturally the best seasons for marketing western C grade and bulk apples are when the eastern crop is light. In other seasons the best markets are those depending principally on shipped-in supplies. Apparently there is a field for extension in the South and Corn Belt region and in the northern wheat belt by means of more complete distribution to the smaller cities and towns. Many of the smaller places are able to handle car lots on joint account through a group of local dealers. Very small markets must depend on mixed carloads or on small lots from the principal market centers.

The most active markets for the C grade, including bulk stock, are those which can be reached at low cost for transportation and those distant markets in which there is little competition with home-grown apples.

Cities of the Pacific Northwest and mountain regions are chiefly supplied with fruit that will not make the regular market grades. The cities of the lower Pacific coast region, especially San Francisco, Los Angeles, and San Diego, use C grade stock. Eastern cities near commercial producing districts are well supplied with stock which competes closely with the lower grade apples from the West.

The estimated proportion of home-grown supply ranges from 25 per cent in Boston and 20 per cent in Philadelphia to less than 5 per cent in many southern and western cities. The great majority of the large eastern markets range from 5 to 15 per cent home-grown apples. The quantity of such stock tends to increase with the modern development of motor trucking facilities. These markets are poor outlets for western fruit until the home grown, which includes many windfalls and others of poor-keeping quality, is mostly out of the way. Many of the small cities and towns of the Northeast are very heavily supplied with cheap stock during the fall months.

Among the large cities with the greatest proportion of home growns are Boston, Philadelphia, Baltimore, Washington, and New York in about the order given. These markets, because of their size, can always handle any quantity of stock but prices are often low. Peddlers are the main dependence for distribution of low-grade fruit to consumers. In Baltimore numerous canneries and preserve factories take much of the low-priced surplus.

In the North and Middle West, few cities report over 5 per cent home grown. The supply is extremely light in New Orleans and cities of Florida and Texas. Reports from these cities mention a good demand for C grade. None of the large markets of the Middle West report over 5 per cent home grown and the general range is 2 to 4 per cent, but most of these markets depend greatly on low grade and ungraded stock from the barreled-apple region.

Among the cities that mention an active market for C grade and unclassified western stock are St. Louis, Omaha, Milwaukee, New Orleans, Atlanta, Houston, Denver, Portland, Spokane, Sacramento, Los Angeles, and San Diego. Low grades from any source are reported hard to sell in Boston, New York, Philadelphia, Chicago, and Washington.

Much stock in bulk and loosely packed in boxes or baskets is shipped from the Rocky Mountain apple sections to southwestern and middle-western cities. Some years as high as 50 per cent of the Idaho shipped crop goes out in bulk.

The far-eastern markets are generally so fully supplied with medium and low-grade apples from barrel sections that western apples of competing grades are sold with some difficulty and at low prices, especially during the early part of a season when the home-grown supply is greatest.

### LEADING BOXED-APPLE VARIETIES

With the growth of the high-class boxed-apple trade, more prominence has been given to varieties of showy appearance combined with regular shape and fairly uniform size. Some of these in turn are feeling the rivalry from new varieties supposed to show special merit in the orchard or in the market. Comparative cost as well as the price of marketable fruit per bushel must be estimated. Growers and dealers both consider the handling, keeping, and selling qualities, while consumers buy according to appearance, reputation, and preference. The leadership shifts accordingly. The early plantings in the Northwest were of the old barrel varieties; later the present standard box varieties took the lead.

### MARKET PREFERENCES

Nearly all of the large markets prefer the bright-red varieties. The Delicious, Winesap, Jonathan, and Esopus Spitzenburg are mentioned as among the best sellers in most markets. The Delicious sells 25 to 75 cents above most standard kinds. The Rome Beauty and Stayman Winesap are usually in good demand. The Yellow Newtown and Winter Banana seem greater favorites for export trade than for the home market. Grimes Golden sells readily in Philadelphia, Baltimore, and Washington. The Yellow Newtown is in fair demand in St. Louis, Chicago, Baltimore, and Washington, but in these markets often sells below such kinds as the Jonathan and Esopus Spitzenburg. The Ben Davis and related kinds sell 25 to 50 cents lower than other standard red varieties in many city markets. The Arkansas Black is a good seller in the South and Southwest. The McIntosh is a good seller, usually at high prices, especially in New York and Boston. The Gravenstein from various sources is a favorite in Boston. The early California Gravenstein sells readily in many large markets and has but little first-class competition during its season.

The kinds least known as boxed apples tend to sell below the average price of the best standard sorts and include such varieties as the White Pearmain, Ortley, Wagener, and Baldwin. Denver reports a premium on large Rome Beauty, but prefers the medium sizes of other kinds. Portland and some other cities of the Pacific coast have come to know the value of the Yellow Newtown for cooking and eating, but the Ben Davis sells slowly in these markets. Los Angeles takes large quantities of California Yellow Bellflower but at prices lower than for the best red kinds. Boston is one of the poorest markets for the green or yellow varieties, except the red-streaked yellow Gravenstein. The green and russet kinds and the sweet varieties are not put up in western boxes in any considerable quantity.

Of 80 well-known commercial apple varieties, only about 25 are often seen in the box pack and only about 15 are found in any great

quantity, while 9 or 10 leading kinds constitute the bulk of the boxed output.

About three-fourths of the sales of boxed apples reported consisted of six leading varieties. These are Winesap, Jonathan, Rome Beauty, Esopus Spitzenburg, Yellow Newtown, and Delicious. The relative rank remained about the same in the three States of the Pacific Northwest from 1915 to 1923, but production of Winesap and Delicious has gained somewhat at the expense of other varieties. Recent reports indicate rapid increase in planting and production of the Delicious. Popularity of the various kinds in producing regions depends partly on market price and partly on ease of production and adaptability to the pack.

The Wenatchee district ships mostly Winesap, Jonathan, Delicious, Stayman Winesap, Esopus Spitzenburg, and Rome Beauty; the Yakima district, the Winesap, Jonathan, Rome Beauty, and Delicious. Roughly one-third of the apple shipments in the Yakima and Wenatchee Valleys is Winesap tonnage. Hood River ships mostly Esopus Spitzenburg and Yellow Newtown. Walla Walla and Spokane ship heavily of the Rome Beauty, Jonathan, and Wagener. Southern Idaho ships mainly the Winesap, Rome Beauty, Jonathan, and Winter Banana. Bitter Root Valley ships the McIntosh liberally; Colorado, the Jonathan and Grimes Golden; California, the Gravenstein, Yellow Newtown, and Yellow Bellflower, besides some of the other standard varieties.

Jonathan, Winesap, Esopus Spitzenburg, Rome Beauty, and Yellow Newtown have been leaders in the boxed-apple markets for many years. The Delicious has been popular during the past few seasons because of the high price obtainable. Some early-bearing varieties used for orchard fillers are now little grown.

In the long run, both eating or cooking quality and good appearance seem necessary to market success. The great bulk of the receipts is of the varieties mentioned, although 20 to 25 varieties are handled in volume more or less considerable. Their leading market characteristics are summarized in Table 16 based on reports from market centers of the East and Middle West.

### THE WINESAP GROUP

A standard late-season variety is the Winesap, leading the older sorts in average price, ranging next to Delicious. Its long-keeping qualities and high color insure a ready sale during the late winter and early spring. Together with the Yellow Newtown, it comprises the bulk of the boxed holdings for the last months of the apple season. Its dessert quality is only moderately good and the skin tends to become greasy after it ripens, but it is one of the most successful market apples.

The Stayman Winesap does not show up so well in a pack as some high-colored varieties that are lower in quality. It is also uncertain in storage because of liability to scald; but its popularity is increasing because of its fairly high quality and its general utility.

The Arkansas (Mammoth Black Twig) is assumed to be a Winesap seedling. It possesses some of the parent qualities, but is generally less attractive in appearance and often shows scald in storage.

Arkansas Black is another relative of the Winesap and often sells at about the same price as the Winesap in the spring. It is a late

keeper, if carefully handled; a very highly colored, handsome general-purpose sort, of rather ordinary flavor.

### THE JONATHAN GROUP

The Jonathan and Esopus Spitzenburg are varieties of full red color, smooth finish, high flavor, medium size, fairly uniform shape, and fair to good cooking and keeping qualities. These kinds are of much importance in the western commercial box pack and are surpassed in prominence only by the Winesap. The season begins in October. They are very popular in the market but seem to be losing ground in some producing sections.

The King David is usually classed in the Jonathan group, with which it has qualities in common. It enters the market much earlier than the Jonathan. The color is a deep red, flavor rather sour, and cooking quality fairly good.

### OTHER LEADERS

The Delicious usually leads the box market in price, although occasionally equalled by Esopus Spitzenburg and Winesap. The reasons for its popularity are its high color and distinctive but regular shape, its comparative freedom from scald, and its excellent dessert qualities. On account of its mild flavor it is not especially valued as a cooking apple. Large sizes sell best but all sizes are in good demand. The Golden Delicious is like the other, except in color.

Rome Beauty is a good apple for the box pack because of its fine appearance, general utility, and good keeping quality apart from tendency to scale in storage. Size is important with this variety and the large sizes are in special demand for baking. The average price is between that of the Ben Davis and Jonathan groups.

The Ben Davis and Gano are red in color, of good size, but low dessert quality, and are marketable chiefly as good-keeping apples. Even at their best they sell below most other box varieties and probably are better suited to the barrel and other cheaper packs. The Gano has somewhat better color than the Ben Davis and sells higher than that variety early in the season. This group seems hardly holding its own commercially.

The Grimes Golden sells highest of the yellow sorts in some markets because of its reputation for eating quality. Even its small size does not lessen its popularity in markets where it is well known. Its weakness, apart from size and color, is a tendency to lose rapidly in condition and quality. On most markets it sells on the average below the Jonathan class.

The Gravenstein, prominent in the early California pack, is a good seller, as it is the earliest choice box apple in the market. It is attractive in appearance with red streaks on yellow background; eating quality and size are good. It is easily bruised, softens rapidly, and has passed its best by October.

Winter Banana is attractive with its bright yellow and red color and waxy finish. Quality is only fair to good. It is a rather poor keeper as it soon becomes soft and mealy. Large sizes sell high, early in the season, but the average price is not by any means equal to the opening levels.

Yellow Newtown is the leading yellow variety in the box trade. It shares the late spring and summer markets with the Winesap, as it is an equally long keeper and possesses similar excellent general utility characteristics. It is a medium-sized roundish apple with a tough skin, firm juicy flesh, sprightly flavor, rich aroma. Lack of great productiveness and the generally unpopular color have limited its prominence in the market.

The McIntosh is one of the few varieties considered adapted to the boxed-apple trade, both West and East. Its season is short, as it tends to break down and lose quality soon after the first of the year.

#### MISCELLANEOUS VARIETIES

The White Pearmain and Ortley are light-yellow varieties of very good flavor and somewhat distinctive appearance. They form only a small fraction of the total supply but are rather popular in markets that do not insist on red color. Varieties of the barrel and basket class occasionally seen in boxes include Baldwin, Missouri Pippin, and Wagener. They compete poorly with the standard box varieties as they do not compare favorably in quality, color, or uniformity.

#### PRICE CLASSES

Well known varieties of box apples may be placed in four general classes as to usual average city wholesale price: (1) The Delicious; (2) McIntosh, Winesap, Esopus Spitzenburg, Jonathan, Winter Banana, and Yellow Newtown; (3) Rome Beauty, Stayman Winesap, Grimes Golden, Gravenstein, and (4) Gano, Ben Davis, and various kinds inferior in quality or in appearance or little known in the box pack.

This grouping varies somewhat from season to season according to relative abundance and excellence and according to the crop conditions of competing varieties. The rating given varies somewhat in the different city markets according to preference in varieties, also when many varieties begin to break down toward the close of their season. The city market differential between the groups ranges generally from 10 cents to $1. Price trends of leading varieties are shown in Figure 25.

### PRICE TENDENCIES

The range of prices of Northwestern boxed apples shows a tendency to steadiness for long periods throughout the season. The supply in storage in large cities seems to act as a price regulator as soon as the period of large arrivals of new shipments is past.

The somewhat independent action of the boxed-apple market may be explained by the character of the boxed-apple supply, which consists largely of table stock of uniform character, is controlled somewhat by marketing organizations, and is handled by a distinct class of buyers in fruit stores and fruit stands. On the other hand, the barrel and basket stock in eastern markets includes most of the cooking apples, represented by such leading varieties as Baldwin, Rhode Island, Greening, Ben Davis, and York Imperial; it is sold to a great extent by growers, provision dealers, and peddlers, responds to a somewhat different set of conditions affecting demand, is in direct competition with local supplies including much low-grade stock, and

is less under control of market associations and large dealers. These conditions combine to bring about a more changeable market than prevails for boxed apples.

### SUPPLY AND PRICE

Daily and weekly reports of apple arrivals at city markets are not especially useful for comparison with the prices to determine the immediate trend of the market but are to be considered rather as an indication of the general situation.

Thus a series of weekly arrivals larger than is usual in the fall, together with fairly steady prices, would indicate that heavy city storage is taking place. This large stored reserve will tend to retard and lessen but not necessarily to prevent any rising tendency of prices later in the season.

APPLES: AVERAGE OF PRICE RANGES OF REPRESENTATIVE BOXED VARIETIES, BASED ON SALES TO JOBBERS IN NEW YORK, BOSTON, PHILADELPHIA, PITTSBURGH, CHICAGO, KANSAS CITY, AND MINNEAPOLIS, AVERAGE OF SEASONS 1922 TO 1924

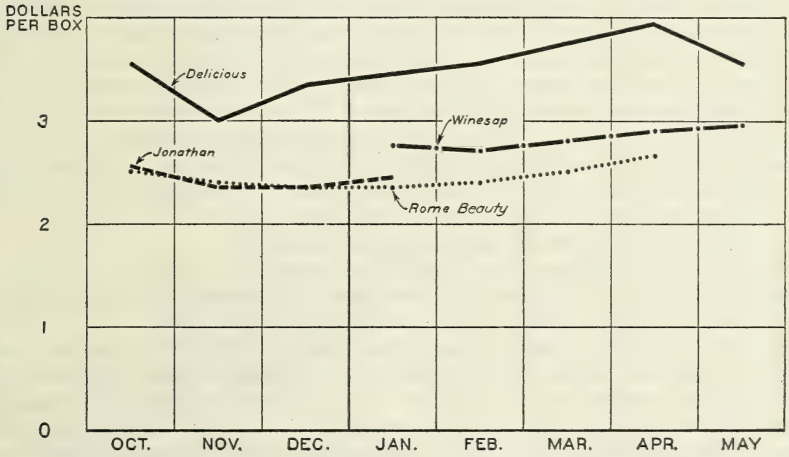


FIG. 25.—A big premium is paid for the Delicious variety

Moderate and decreasing arrivals week after week, amounting to less than average weekly consumption, yet with no important change in price, would indicate that supplies are coming out of storage to fill the gap. If prices rise when receipts are stationary or decreasing in volume, it is probable that the market is depending largely on current arrivals. The monthly or semimonthly reports of stock in storage should be watched for indications of the supply to be expected from that source.

Reports of quantities expected, as reported in car-lot shipment summaries, also bear upon the domestic supply and market. Comparison of arrivals with average consumption, with reports of stock in cold storage, with the export figures, the quality of the stock offered, total shipment figures, and the price movement, all assist in forming correct judgment of the market position.

### USUAL TREND AT SHIPPING POINT

Prices of boxed apples, Extra Fancy Winesaps, medium to large sizes, at northwestern shipping points, tend to advance throughout the season along with the usual decrease of holdings and the gradual addition of storage costs, but in some seasons of heavy production the rise does not occur. The advance from October to March, 1917–18, 1919–20, 1920–21, 1921–22, was 15 to 50 cents per box, usually near the lower figure. In 1918–19 came the boom year advance of about $1.50. In 1922–23 there was no sustained rise, and in 1923–24 sales in March averaged 10 to 25 cents lower than during October. Only in 1918–19 and in 1921–22, two out of seven seasons, was there any great well-sustained advance. In one of these cases the gain followed the reopening of the export trade, and in the other season the advance was apparently the result of failure of the eastern crop.

### PRICES OF SEVERAL MARKET SEASONS

The markets of 1918–19 were unusually favorable to apple holders, because of the scarcity of other fruits and the general price inflation. Quotations ranged 50 to 75 per cent above the two preceding seasons, although even the season before, that of 1917–18, averaged higher than for previous years. Extra Fancy Winesaps opened in October, 1918, at $1.85 to $2 f. o. b. northwestern shipping points, and advanced gradually to $3.50 in March, prices averaging at that time about double the prices of the year before. During the early part of this period consuming markets ranged mostly from $2.75 to $3.50, but reached tops of $4.50 and $4.75 in March.

In 1919–20 the range continued high at $2.25 to $3.25 f. o. b. and mostly $2.75 to $5 in the city markets. Freezing, lack of storage facilities, and the car shortage were serious drawbacks.

Boxed apples felt the general price slump of 1920–21, but held up better than most agricultural products. Average yield was low and the apples were small. Extra Fancy northwestern Winesaps, medium to large, ranged from $2 to $2.50 f. o. b. at shipping points. They opened around $3 in the city markets and closed around top price of $4.

In 1921–22 the boxed-apple market was helped by the extremely short crop in the barrel region. A range of $2.50 to $3.50 covered most of the jobbing sales.

The 1922–23 market season was dull and unsatisfactory, because of the rather poor average quality of the western crop and the abundance of supplies in nearly all apple sections. Winesaps sold about 50 cents lower than in the preceding season, and early jobbing prices for extra fancy sometimes dropped below $2, but averaged about $2.50 the second half of the season. Most sales f. o. b. at shipping points ranged from $1.50 to $1.75.

The large and excellent western crop of 1923–24 competed with a large output in the East and sold at prices unsatisfactory to the growers. Combined boxed and barreled shipments of 138,000 carloads included gains over the season before of about 17,000 cars from the West and 8,000 from the East. The prevailing city range for Extra Fancy Winesaps was $2 to $2.50, while prices at shipping points ranged from $1.20 to $1.50. The market pressure was relieved

somewhat by very heavy apple exports amounting to about 12,000,000 bushels.

The commercial crop East and West was light in 1924, with 29 per cent less in the box region and 13 per cent less in the barrel region, compared with 1923. Cold storage and export again took an unusually large share of the crop. The current supply was moderate at all times. Demand was good and prices tended upward. Extra Fancy Winesaps started at $2 to $2.25 f. o. b. and $3 in leading eastern markets, but advanced by the end of January to $2.85 f. o. b. and $3.50 to $3.75 in the cities, holding firmly to the end of the season. City prices of leading varieties and grades generally ranged at least $1 per box higher than for the season before.

Many of the same general conditions prevailed in 1925–26, but apple shipments one-fourth larger caused a slowly declining price trend through most of the season. Prices closed generally one-third below those of the season before.

Northwestern boxed-apple prices have been more nearly uniform than prices of barreled apples from season to season during the 10 years following 1913. Extra Fancy grades of leading standard varieties like Jonathan, Esopus Spitzenburg, and Winesap have commonly sold in eastern markets around $3 per box, seldom at more than $4 during the early part of the season or less than $2, as compared with extremes of $1.50 to $10 per barrel for the Baldwin. Apparently the usually smaller output and more thorough and systematic grading, packing, and marketing are mainly responsible for the difference in market action.

#### FORECASTING BOXED-APPLE SEASON

The market situation of boxed apples depends chiefly on commercial production. Since the market for boxed apples is in some degree independent of the barreled-apple market, the price trend of boxed apples responds more to production changes in the box area than to those of barreled apples. Thus a small proportion of box apples tends, in the commercial crop, to raise the price higher than would be expected from consideration of combined production, as occurred in 1918, 1920, and 1924. The December prices have often shown about the same relation as the size of the respective commercial apple crops. The production estimate of the United States Department of Agriculture has been of itself a useful early indicator of the December jobbing price. Besides commercial production and the proportion of the boxed crop, price influences of some importance are the foreign apple productions, particularly in Canada, England, and continental Europe, also the size of the California and Florida orange crops and, finally, the general price tendency of commodities including farm products. The last-mentioned influence was strong in the three years 1919, 1920, and 1921, following the war period.

## COST OF MARKETING

An analysis of the retail price for Extra Fancy and Fancy grades of northwestern boxed apples, sold in certain individually owned grocery stores in the New York port district, indicates the following approximate margins and charges:

| Item | Distributed cost per box | Percentage of retail price per box |
|---|---|---|
| Margin received by: | | *Per cent* |
| Retailer | $1.87 | 37.4 |
| Jobber | .49 | 9.8 |
| Wholesaler | .39 | 7.8 |
| Shipping organization | .27 | 5.4 |
| Transportation charges | .80 | 16.0 |
| Grower's portion per box | 1.18 | 23.6 |
| Retail price per box | 5.00 | 100.0 |

Because of the many possible channels which may be used in the distribution of northwestern apples, some discussion of these margins and charges is necessary. In this analysis, certain assumptions must first be made because of these various possible channels of distribution. It was therefore assumed (1) that the apples sold were equal quantities of Extra Fancy and Fancy Winesaps, sizes 72 to 163, inclusive; (2) that the apples were sold by grower organizations f. o. b. either Wenatchee or Yakima district, Wash.; (3) that purchase was made by car-lot receivers (wholesalers) in New York City; (4) that distribution to retailers was made through jobbers in five important jobbing centers of the New York port district who purchased apples from wholesalers in the central wholesale market; and (5) that retail distribution was through retailers operating individually owned grocery stores.

Within the limitations established by these assumptions, which are based on information collected by the United States Department of Agriculture, the margins or divisions of the retail price show the approximate distribution of the price paid by the consumer for apples sold through these stores. Any other necessary limitations or assumptions will be discussed under the individual margins and charges.

### RETAILER'S MARGIN

The length of time covered in the collection of retail prices for this study is the period between February 2 and May 11, 1923. During this period, retail prices for Extra Fancy and Fancy grades of Winesap apples, sizes 72 to 163, inclusive, were collected by the Bureau of Agricultural Economics, United States Department of Agriculture, and by the port authority from a number of individually owned grocery stores in the New York port district. The period for which retail prices were collected covered the year's retail business for this variety of apples which did not appear in these stores before January 15 nor after May 15. These stores are of the type extending credit and delivery service to their customers.

Examination of the prices indicated that $5 per box was a representative retail selling price for apples of these grades and sizes.

The retailer's margin shown in the preceding table represents the difference between the average cost to retailers and the average retail selling price. From this retail margin must be deducted all expenses chargeable to the sale of apples, such as store maintenance, salaries and wages of employees, credit and delivery service, and loss and shrinkage of fruit, before any net profit is realized by the retailer from the sale of these apples.

### JOBBER'S MARGIN

Jobbing prices for the same period were collected by the Bureau of Agricultural Economics and the Port of New York Authority. The prices to jobbers used in determining the jobber's margin were those collected by the market news service of the bureau. The average price to jobbers ($2.64) was deducted from the average price to retailers ($3.13) in order to determine the jobber's gross margin of $0.49. This is also a gross margin from which must be deducted expenses incurred in rendering the jobbing service. The more important of these expenses are (1) transportation from the central wholesale market to jobbing centers, (2) maintenance of a place of business, (3) salaries and wages of employees, (4) credit service to retailers.

### WHOLESALER'S MARGIN

The wholesaler's margin ($0.39) was determined by deducting from the average price to jobbers ($2.64), the average f. o. b. sale price in the producing areas plus transportation to New York City ($2.25). This margin, like the others, is a price margin from which considerable variation may occur in individual instances.

From this margin must be deducted the expenses incurred by the wholesaler in rendering his portion of the services of distribution. The principal function or service of the car-lot receiver is the distribution of less-than-carload lots to jobbers. Before the wholesaler realizes any profit, all expenses chargeable to the sale of apples must be deducted from the gross wholesale margin as follows: (1) Unloading cars; (2) handling at central wholesale market; (3) loading and hauling to jobbers' trucks; (4) maintenance of a place of business; (5) salaries; (6) cold-storage expenses, if he assumes this function; (7) any extra transportation charges properly chargeable to the wholesaler (demurrage, extra diversions, storage-in-transit privilege, etc.); (8) loss and shrinkage in the quality or quantity of apples handled, etc. When these and other expenses chargeable to the sale of apples have been deducted, the wholesaler may then realize a profit.

The wholesaling function is sometimes preformed by other agencies than the car-lot receiver located in the central wholesale district. Shippers or shipping organizations may, through their brokers or agents, turn over the shipments for sale by auction. In this case the auction fee may be less than the ordinary wholesale selling margin which it replaces. Under these circumstances the net return to the shipper would be increased by the difference between the wholesale margin and the auction fee, provided auction prices to jobbers and wholesale prices to jobbers were the same.

### TRANSPORTATION CHARGES

From points in the Wenatchee and Yakima districts of Washington to New York City, transportation charges vary with the type of service required. The per box charge from Wenatchee or Yakima to New York during the 1922–23 season for shipments moving under shippers' protective service, if 756 boxes of apples were loaded to the car, was about 74 cents.

The per box charge during this season for shipments moving under heater service from Wenatchee or Yakima to New York City was about 78 cents per box with 756 boxes loaded to the car. If shipment was made under standard refrigeration, the charge from Wenatchee or Yakima to New York City was about 87 cents per box. The 80-cent amount shown as transportation charges is an average based on the shipments made to New York by the organizations included in this study.

### SHIPPING ORGANIZATION CHARGES

Results of a study of the cost and sales records of eight shipping organizations located in the Wenatchee and Yakima districts are the basis for the amount shown as the shipping organization margin. This margin ($0.27) consists of a number of expenses, including those of the organizations and charges paid by them for services rendered by outside agencies. The more important of these expenses which must be deducted from the organization's f. o. b. shipping point price ($1.45) are (1) labeling, (2) warehousing, (3) cold storage and some storage-in-transit charges, (4) brokerage or other marketing organization charges, (5) expenses of selling and traffic department if the shipping organization maintains these departments, (6) fees for membership in federations or associations, (7) Government or private inspection service, (8) any extra transportation charges properly chargeable to f. o. b. sales (extra diversions, demurrage, etc.).

### GROWER'S PORTION PER PACKED BOX

The $1.18 indicated as the grower's portion per packed box is the average price per box received by the grower for Extra Fancy and Fancy Winesap apples, sizes 72 to 163. This return is determined by deducting the average shipping organization margin ($0.27) from the average f. o. b. producing area price ($1.45). The average pool price of all sales of these grades and sizes obtained by growers in eight shipping organizations in Wenatchee and Yakima was $1.12, so that $1.18 can be considered a representative return for apples sold through the channels of distribution included in this study.

From the grower's portion must be deducted (1) packing expenses—box, paper, nails, labor, and overhead which together amounted to about 40 cents per box during the 1922–23 season—and (2) production expenses—pruning, spraying, thinning, irrigating, maintenance of equipment, picking, interest on investment in orchard and equipment, etc. On the basis of these figures, apples selling at an average of $2.64 to jobbers showed approximately 78 cents to the grower after packing expenses were taken out, but before any production expenses had been deducted.

## COLD-STORAGE HOLDINGS

The public cold-storage warehouse is not linked directly in the chain of distribution. It does not hold possession of the fruit and is not responsible except to the extent of maintaining the desired temperature during the season of storage with exercise of care and prudence in the management of the plant and its contents. The storage concern is merely the trustee of the man who stores the goods, except the relatively small number of privately owned commercial cold-storage plants.

Public cold storages pay the incoming freight and often carry the storage charges until the apples are sold. In years when cold-storage space is plentiful, solicitors for cold-storage companies often make advances of 50 to 75 cents per box to the shipper.

Cold storage of apples is a development chiefly of the past 25 years. Stocks in cold storage December, 1898, according to unofficial reports, were only 800,000 barrels. The increase was very rapid to 1903 when there were 2,348,000 barrels, and in 1923 there were about 10,000,000 barrels or much more than a quarter of the commercial crop. Cold storage is still mainly in the large cities where the space can be profitably used also for other products, making a demand for cold storage throughout the year

Heaviest storage of boxed apples outside of the producing districts is in Chicago, New York, Omaha, Kansas City, Minneapolis, St. Paul, St. Louis, and Philadelphia. In the Pacific coast region the principal storages are in San Francisco, Los Angeles, Watsonville, Hood River, Wenatchee, Seattle, Portland, and the Yakima Valley. Yakima and Wenatchee combined have space for about 4,500,000 boxes. Washington and California each usually has in cold storage 1 to 2 million boxes at the height of the season. Storage stocks in San Francisco and Los Angeles include many receipts from the Northwest and the Rocky Mountain apple region. Watsonville storage is filled with locally grown Yellow Newtowns and Yellow Bellflowers. Some 300,000 to 400,000 boxes are stored in Oregon. Arizona, Colorado, Idaho, Montana, New Mexico, and Utah together store about as many as Oregon. The storage season becomes active in October, increases in November and December, then decreases rapidly. Holdings of boxed apples are usually very heavy in the Central States, far exceeding holdings of barreled apples; but New York and most Eastern States store most heavily of barreled apples. However, holdings of boxed apples in New York State often exceed a million boxes.

At the height of the season in January, holdings of boxed apples in cold storage are from one-fourth to one-third of the commercial crop. Most of the stock has been taken out by the end of June. In January, 1924, with a fairly typical season, the holdings were about one-third in the West, one-third in the Middle West, and one-third in the remaining sections.

The greater part of the stock is moved during January, February, March, and April, but the long-keeping kinds, mainly Winesap and Yellow Newtown, in oiled paper wraps, are held to some extent throughout May and June. The chart, Figure 26, indicates the usual time of greatest holdings and the progressively rapid withdrawal after the first of the year. In many cities the boxed holdings persist a

month or more after the barreled holdings have been practically exhausted. The market effect of cold storage is to regulate the supply and prolong the season, adding to the cost of the fruit 15 to 20 cents per box for the seven-months storage season, October to April, or a smaller amount if stored by the month and moved before the end of the regular season.

## MARKET SUPPLY INCREASING

Supplies of northwestern boxed apples seem to be increasing relatively faster than those of barreled apples in the 12 cities reporting over the six-year period, 1918 to 1923, as charted in Figure 27. Unloads of barreled stock in 1923 were 24,887 cars or approximately 3,000 more than in 1918. Boxed unloads in 1923 were 19,854 cars or over three times the total for 1918, although some allowance for incompleteness may be necessary for the unload reports of the

APPLES: COLD STORAGE HOLDINGS, BOXED AND BARRELED, BY MONTHS, AVERAGE OF SEASONS 1918 TO 1923

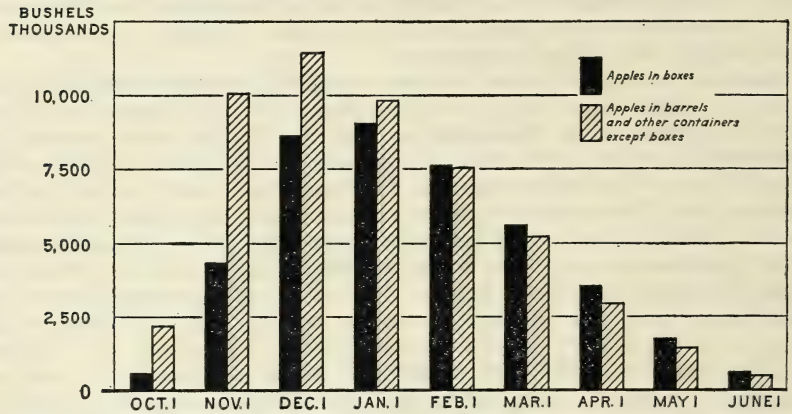


FIG. 26.—Stocks of boxed apples in cold storage reached greatest volume later than barreled apples and were withdrawn more gradually for distribution

earlier years. The increase in barreled receipts was continuous except in 1919 and for the very short crop of 1921. Boxed unloads showed yearly increases of 2,000 to 6,000 cars throughout the six years with the exception of 1922. In 1919 the proportion of increase in boxed unloads was nearly 50 per cent, and in 1923 the total was more than 200 per cent greater than in 1918; barreled unloads showed only 15 per cent increase in the same period. There was a large crop of barreled apples in 1920 and nearly two-thirds of the total movement of that shipping season was from the barrel sections, yet the proportion of boxed apples among the supplies of these cities was considerably greater than in 1918, when barreled apples constituted about the same per cent of the total shipments to all cities. In 1921, a year of short crops in the barrel States, boxed apples composed 47 per cent of the car-lot supplies of the 12 cities.

Increases in shipments during the six-season period were, roughly, 31,000 and 37,000 cars for barrel and box sections respectively, or

proportionately 70 per cent and 146 per cent. Nearly one-third of the gain in shipments was accounted for in the greater volume of unloads at the 12 cities. In 1921, a short crop year for barreled apples, shipments of boxes increased about 20,000 to 56,871 cars. In 1922 the quantity dropped by more than 11,000 to 46,290 cars, and in 1923 it advanced to 63,005, or 46 per cent of the combined boxed and barreled shipments for that year. Total shipments from both sections, as well as total unloads are more nearly steady from year to year, a short crop in either boxed or barreled section tending to stimulate distribution in the competing region, although both show a tendency to increase over a period of years. This discussion is based on car-lot quantities as given in Table 7.

A more definite comparison with barreled stock is illustrated in Figure 28, using the bushel as a basis. It is estimated that a car

APPLES: CAR-LOT UNLOADS AT 12 CITIES, BY REGIONS, AVERAGE OF CALENDAR YEARS 1918 TO 1923 (EXPRESSED IN BUSHELS)

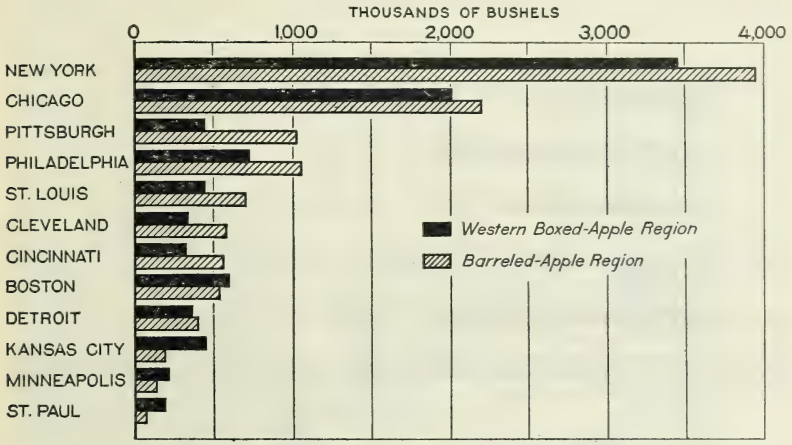


FIG. 27.—Car-lot unloads are compared in bushels on the basis of 756 bushels to a car of boxed apples and 525 to a car of barreled

of boxed apples contains 756 boxes or bushels. The number of barrels to a car varies but an average of 175 standard barrels, or 525 bushels is used.

## INCREASING THE DEMAND

Development of new markets and increasing the sales in the old markets are the obvious means of improving the demand. Cooperative associations, private sales agencies, and dealers at shipping points keep in close daily touch with brokers by wire and correspondence to learn whether large markets, as well as the adjacent towns and cities are well supplied. Salesmen are kept on the road to push the sale of individual brands. They work to increase the sale of boxed apples in the larger centers and to explore and develop smaller neglected markets.

A year of partial failure of the eastern crop offers special opportunity for entering new consuming markets. The decline of the

old-time small farm orchard in the East has made consumers increasingly dependent on shipments from more or less distant orchards.

Special methods of stimulating the consumer demand are widely employed at the height of the season as a part of the observance of the annual apple week in the principal market centers. These methods include: News items and paid advertisements; published apple interviews with prominent people; subway, elevated, and surface-car posters; banners for trucks; street signs and banners; window cards and displays; apple shows and exhibits; special retail sales of apples and chain-store cooperation; proclamations by governors, mayors, and other officials; radio talks; special club luncheons; gifts of apples to charitable institutions and hospitals; apple studies, lectures, and apple essay and poster contests in schools and colleges; cooking demonstrations; motion pictures; featuring of apples in theatrical performances; parades; free distribution of

APPLES: TOTAL CAR-LOT SHIPMENTS WITH UNLOADS AT 12 CITIES, BY REGIONS, SEASONS, 1918 TO 1923 (EXPRESSED IN BUSHELS)

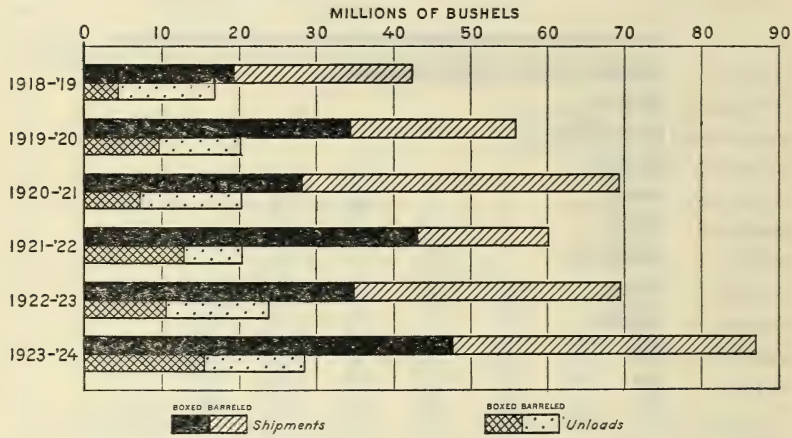


FIG. 28.—About one-third of the boxed-apple shipments are unloaded at 12 cities

apples from floats in business section, in schools, theaters, churches, public meetings, dinners, on railroad trains, dining cars, and at commercial institutions; special menus on dining cars and steamships, in hotels and restaurants; news-stand publicity; apple recipe books; stickers; and publicity through railroad publications and special apple booklets by carriers, and cooperation of chambers of commerce and State departments.

Certainly the high quality of the boxed-apple pack, together with aggressive methods of advertising and distribution, has tended to increase the consuming power of the domestic markets and has favored rapid growth of the export trade.

## FOREIGN TRADE

### EXPORTS

In 1895 about 13,000 boxes of apples were shipped from New York to English markets (fig. 29). By 1900–1901 the box shipments had increased to over 200,000, and in 1910–11 to 940,000, besides 147,000

from Boston, which began to report box shipments that season. Portland, Me., began in 1912. In 1923, from January to April, 1,524,142 boxes were shipped to 45 countries and dependencies, and 1,870,000 boxes were shipped during the whole 1922–23 season. Box shipments for the first three months of the 1923–24 crop season averaged about 200,000 per week and the season's total exceeded 6,000,000 boxes. Box exports and barrel exports in recent seasons were about equal in volume stated as bushels. In British and in some West Indian markets, barrels continued to lead, but most other regions have been taking more apples in boxes than in barrels.

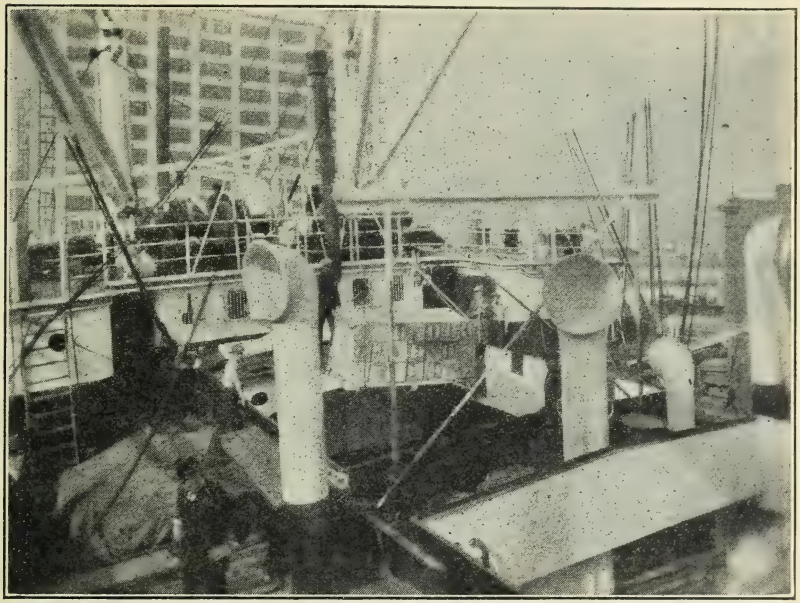

FIG. 29.—Loading boxed apples for export at Hoboken, N. J.

### EXPANDING EXPORTS MARKETS

Active resumption of shipments of boxed apples to Germany and the heavy movement to Pan-American ports were features of 1922–23, and 1923–24. Exports from Seattle (fig. 30) and Portland on the north Pacific coast have been important since 1920, including shipments to South American and Asiatic ports, as well as to Europe. One shipper sent the equivalent of 50 carloads of boxed apples to Buenos Aires in 1923–24. For the 12 months ended June, 1923, the customs districts of the Pacific coast reported as many exports of boxed apples as were reported shipped out from New York. Over a million boxes, equivalent to 1,300 carloads, were cleared from Portland harbor alone. Direct shipments from Portland and Seattle to ports of continental Europe in refrigerator ships by way of the Panama Canal have proved very satisfactory.

The season 1922–23 was the first in which there were very large surplus crops of boxed as well as barreled apples. The car-lot move-

ment of boxed apples in domestic markets was only about two-thirds that in barrels during the season. Boxed-apple exports were equal to about 5,000 carloads, or somewhat more than 10 per cent of the total domestic car-lot movement of boxed apples. Exports in barrels equalled 2,000 carloads, or less than 5 per cent of the car-lot apple movement from the barrel regions. The United Kingdom took about two-thirds of the boxed apples, but nearly a million boxes were shipped to other countries, particularly to Canada, Norway, and Latin America. Shipments of 91,500 boxes to the Philippines marked the rise of a fairly important new market.

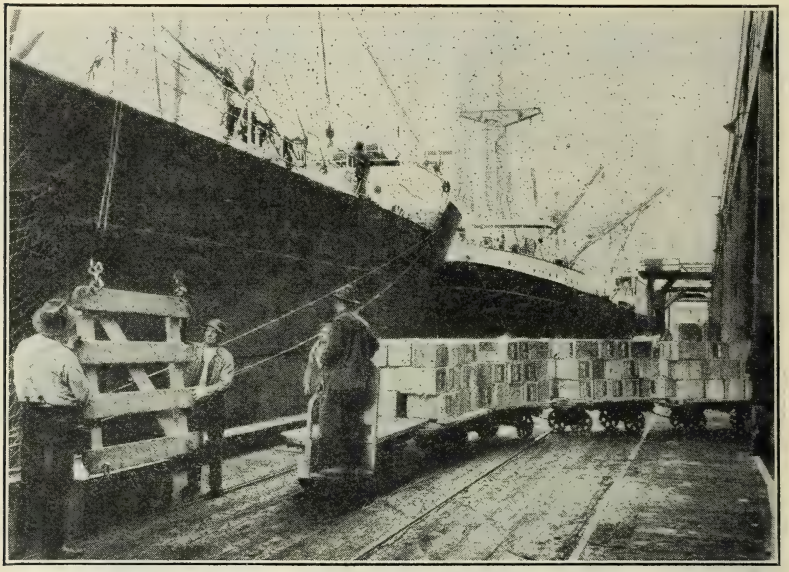

FIG. 30.—Method of loading apples for export at Seattle

Boxed-apple exports in 1923–24 were about equivalent to those in barrels. Of over 6,000,000 boxes, about two and one-half million went to other markets than those of the United Kingdom. Growth of the trade was notable in Germany, the Scandinavian countries, Canada, and Latin America.

Argentina is the principal South American market for boxed apples. Receipts of American boxed apples are reported by value and appear equivalent to about 75 carloads yearly average, a small item compared with the European trade.

### VARIETIES AND PACKS

The favorite boxed-apple varieties for export trade are the Yellow Newtown, Winesap, Jonathan, Spitzenburg, and White Pearmain. The yellow and green varieties are more popular in British markets than most American consuming centers.

Small sizes are often very salable because of the demand for stock that gives the consumer as many apples as possible to the pound. Medium to rather small sizes are the most desirable for dessert apples in British markets, especially in London. Sizes larger than

150 to the box or smaller than 188 are likely to sell for less, but in seasons when the crop runs mostly to large sizes there is often active demand for sizes as small as 200 or 216.

The requirements of grading and packing boxed apples for foreign trade are not in general different from those in packing for cold storage. A strong, well-nailed package, strapped at both ends, and a tight pack tend to reduce loss from damage and waste. Special requirements of the season and of the prospective market should be considered in selecting the varieties and sizes exported. Federal inspection certificates have a similar significance in foreign and in home markets and many apples for export are now inspected before loading (fig. 31).

FIG. 31.—Federal officer inspecting boxed apples for export

### SHIPMENT

Although about one-half of the total of exported apples is shipped in common cargo, boxed apples are more often shipped under refrigeration because of the long journey from producing section to final market. Some steamships are equipped with mechanical refrigeration plants and ventilation systems. The experienced care of the shipmaster and of the refrigeration engineer are needed to prevent damage in loading or unloading or from unfavorable conditions of temperature, moisture, and ventilation. Boxes are stowed on end and held in place by car strapping across each tier of boxes. Not all the poor stock received is the result of the ocean voyage. One source of delay and loss is the tramp car, which has been diverted from one point to another in search of a market and finally turned over to the exporter. Even at the point of export there is sometimes poor connection with the steamer and rough handling.

### SELLING IN BRITISH MARKETS

The prevailing method of sale at port of arrival is by consignment to dealers and to auctions in the port market. The dealers sell immediately on the local auction to wholesalers, many of them speculative buyers. The auction traders sell to small buyers and the stock finally reaches the consumer through a chain of at least three or four dealers.

Other sales are by commission dealers who receive consignments from their agent or representative in the United States or from shippers' associations or who act as agents of the receiver and sell to their regular trade consisting mostly of jobbers and retailers.

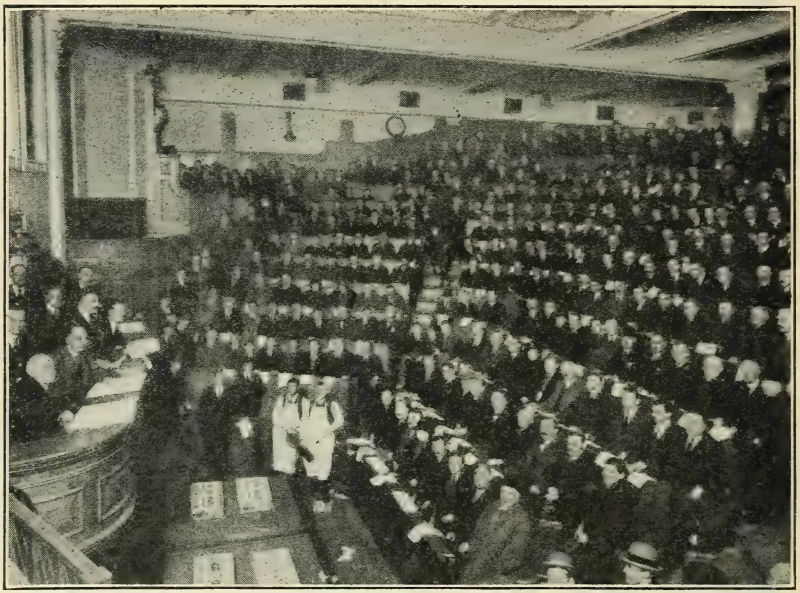

FIG. 32.—Selling boxed apples at a Liverpool fruit auction

### PORT AUCTIONS

The auction method has had the same prominent position in the British markets as in the disposal of boxed apples in many large cities of the United States. Reports from a dozen large English trade markets indicate that about nine-tenths of the import apple sales are by auction. Figure 32 shows a Liverpool fruit auction room where American boxed apples are sold.

The auction sales are made by samples shown in the sales room. A couple of boxes of each lot as sold are placed on display with lids removed, and from these the wraps are pulled from perhaps half of the top layer. Prospective buyers have permission to inspect the consignments as unloaded at the docks. The buyers themselves in some markets are closely organized and insist on regulations and practices regarding the taking of samples or the rejection or adjustment of purchases.

Bidding is open to the public in some markets, but in others it is restricted to members of buyers' associations. Auctions may be restricted both as to who offers apples for sale and who shall bid for them.

Charges from ship to final delivery at auction vary from the equivalent of 18 to 30 cents per box, besides commission of 3 to 7 per cent.

Facilities vary considerably. Shipments may be unloaded direct to the auction place on the wharf and then transferred to the car on the other side to be carried to final destination as directed by buyer. At another port arrangements may be far less convenient and the port restricted by old regulations and customs, and there may be a whole series of handling and hauling charges between the ship and the final buyer. It can not be said that gross or even net returns are necessarily higher at the better equipped markets. Northern ports have the reputation of higher gross prices because supplying a region that is without much native fruit and with less competition from low-grade apples shipped from continental Europe, although often the supposed advantage is more than offset by extremely heavy arrivals from American ports.

At some auctions, sales are guaranteed and paid for by auction firms before collection is made from buyers; at others, provision is made for rejections or claims. The six main port auction points are Glasgow, Liverpool, Manchester, London, Hull, and Southampton; each is a center of supply for its market territory within 50 to 100 miles. London is a leading port of arrival for American apples, but Liverpool is a very important distributing center for northern cities. Glasgow is the great receiving port of Scotland and has a very successful auction system. Manchester with its ship canal, and Southampton with its improved docking facilities, are of growing importance. Cardiff and Bristol serve the markets of southern Wales and western England. Hull and North Cardiff distribute to places on the northeastern coast, and Hull is the leading point of reshipment to Denmark, Norway, Sweden, and Holland, receiving 225,000 packages of American and Canadian apples in 1923.

The volume, frequency, and publicity of auction sales make them a general barometer of market prices. Even the private-sales dealers sometimes turn over to auctions the low-grade surplus fruit. On the other hand, some private-sales dealers have established very desirable trade in the best grades of apples. Their facilities are preferred by many shippers who wish to build up a reliable permanent demand for a superior brand of fruit. For the general run of apple sales, auctions are showing gain in volume of business. Some cooperative associations ship to them direct. Auctions are preferred by some shippers, because of the certainty of prompt sale and payment and the publicity of the price record.

### OTHER MARKETS

Norway, Sweden, Denmark, Holland, and Germany show preference for boxed apples of medium size and the standard red varieties. Orders are placed by Danish importers through their American agents, who in turn place the orders with shippers. Collection is made by sight draft, attached to bill of lading. Many boxed apples are sold at the semiweekly auctions in Copenhagen, Gothenburg,

and Rotterdam, which are attended by the apple buyers from Holland and the Scandinavian countries. Rotterdam is the distributing point for Holland, the Rhineland, and as far south as the Swiss border.

Auctions are held at the steamship sheds on Mondays and Wednesdays. The brokers have their men at the docks, who separate the packages of fruit into piles according to variety, brand, size, and grade as they are unloaded. The fruit is then catalogued for sale in the manner that is common to all fruit auction sales. Some of the Dutch brokers maintain branch houses in western Germany to work up trade and maintain direct connections with that trade. In years of normal crops, Holland and Germany are supplied with domestic apples during the fall months. Ordinarily there will be some demand for American apples for the Christmas trade starting the 1st of December, but the real demand comes after the 1st of January and lasts until the end of the season. Rotterdam shows a much keener demand for boxed apples than for those in barrels. The outlet is for fancy fruit.

The time element is important in filling orders placed by Danish agents, and shipments not arriving on time are likely to be rejected. For this reason direct shipments are seldom made to Denmark from Pacific ports. Most of the supply in Scandinavian markets is from stock held in New York or reshipped from Hull or other British port markets. Auction sales at Hamburg are a feature of the German trade in American boxed apples. The demand is for wrapped stock, medium and large sizes, 130 and larger, of leading red varieties, especially the Delicious, Jonathan, Winesap, and Rome Beauty.

Argentine importers order by cable, paying for the fruit on receipt of bill, or they handle on commission. The fruit is placed in cold storage at Buenos Aires and sold in jobbing lots.

More boxed than barreled apples enter Cuba from the United States. Leading boxed varieties in the Cuban market are Winesap, Jonathan, and Delicious from Washington and Oregon. These are in general demand for eating, and compose about two-thirds of the apple imports from the United States according to local reports. They sell for about the price prevailing f. o. b. shipping points in producing sections with tariff, freight, storage, and commission added, amounting to about $1.50 per box additional. The barreled apples include many of the York Imperial and Ben Davis from Virginia, Pennsylvania, and New York.

Australia and New Zealand have attracted some attention from American apple-exporting interests; but the trade has never reached any great volume because of transportation difficulties, import restrictions, and perhaps the lack of vigorous, persistent effort to develop these markets. Australian importers usually buy f. o. b. shipping point through their agents on the Pacific coast and distribute their imports mainly from Sydney in New South Wales. In New Zealand importers usually buy f. o. b. of Pacific coast dealers, but they handle some fruit on consignment, selling it direct to dealers and sometimes at auction.

### CLOSE COMPETITORS

Canadian boxed apples in foreign markets, especially those of the United Kingdom, are close competitors of boxed apples from the United States. Their season is about the same and their grades and packs are similar. Canadian shippers are supplied with official infor-

mation on prices and market conditions. The United States northwestern boxed apple has been able to hold its own because it is longer known and strongly established in favor, with the aid of long experience in packing, aggressive marketing, wide distribution, and a well-developed system of transportation. Several of the leading northwestern varieties, like Winesap and Yellow Newtown, are particularly well suited to the requirements of export trade. Apples from Australia and New Zealand follow those from the United States. They compete at the end of the season rather than at the beginning. Dealers accordingly attempt to clear out the supply of American apples before the Australian apples come on the market.

### PRICES AND THE SUPPLY

In a well-balanced export market situation, the foreign apple prices would naturally correspond closely with the domestic markets, allowing for difference in freight and various extras. But often the

APPLES: AVERAGE OF PRICE RANGES IN NEW YORK AND IN BRITISH MARKETS, 1923-24

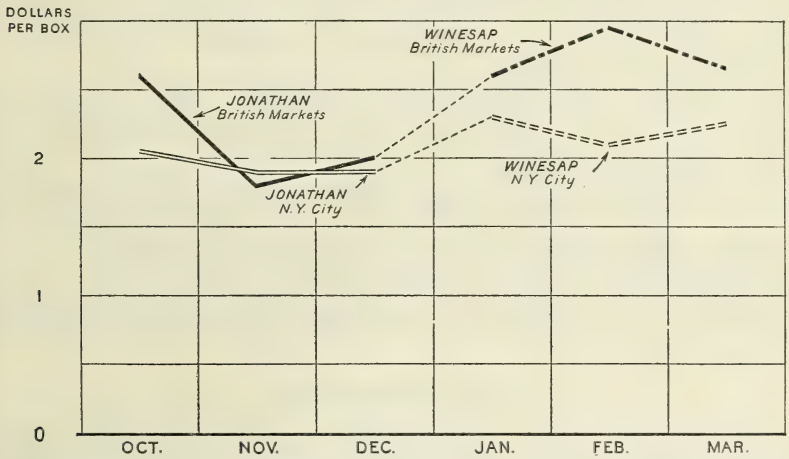


FIG. 33.—Heavy exports in 1923 depressed the British market, bringing the price of Jonathans to the level of the New York market

price correspondence is by no means close (fig. 33). In the closing months of 1923 standard varieties of various grades were selling from 90 cents to $1.50 f. o. b. northwestern shipping points. Adding 90 cents for direct ocean freight with refrigeration would bring them to a delivered cost price basis of $1.80 to $2.40. Selling range at port markets of the United Kingdom during the closing weeks of 1923 was $1.50 to $3.08. The lack of foreign quotations by grades and sizes makes close comparison impossible. Domestic markets, including auctions, ranged at the same time mainly from $1 to $2.50, which was not far from the general level of the export market, freight differences considered. Evidently some of the sales showed a net loss in either case. The uneven and irregular rate of supply causes many discrepancies in comparing the market levels. A better-regulated supply would tend to keep export shipments within a volume which at least could be sold at the average cost and expenses.

Cooperation between shippers to foreign markets in an effort to regulate the flow of supplies and thus to stabilize prices is urged by special marketing agents of the United States Department of Agriculture, who recommend a careful study of current market conditions to avoid glutted and undersupplied markets.

Certain cooperative organizations have urged that the system of centralized distribution be extended to foreign markets. By such a plan distribution would be handled by one agency which would determine to which port shipments should come and would regulate distribution to interior markets or reexport to Continental Europe. Direct shipments might be made to Dutch and Scandinavian seaports, it is urged, with a similar plan of distribution to their surrounding territory. The demand would be encouraged by advertising. It is claimed that supervision of consignment and distribution would remove many of the speculative elements of the foreign trade by preventing excessive or irregular supply or the overloading of some markets while others are neglected. The highly organized methods applied to the box pack in the producing sections and its high quality and standard grading make the product especially suitable for centralized distribution. The low per capita consumption of apples in Europe and even in the United Kingdom suggests a wide field for expansion of the demand.

In British markets, as elsewhere, the higher freight charges since the World War and higher prices at retail are cited as limiting the distribution of apples. The per capita consumption of apples in the United Kingdom is estimated at less than half that of the United States or Canada. The apple imports of the United Kingdom, from all sources, are about 8 million bushels per year, having increased about one-third during 1920, 1921, and 1922, as compared with pre-war years. About one-half the total is from the United States. Average production of apples in the United Kingdom is about the same volume as the average imports and has shown no definite increase in the past 15 years.

### TRADE IN DRIED APPLES

Exports of dried apples were stimulated by the great apple crop of 1896 and reached the unusual total of 27 million pounds in that year. They continued heavy and increased year by year, reaching 54 million pounds in 1912. They were interrupted by the war period and continued light for several years after the war, although recovering to nearly 17 million pounds by 1923. Shipments are nearly all to western Europe. Germany and Holland led in pre-war seasons and since 1920 these countries seem to be regaining former volume of trade, taking over one-half the exports in 1921 or about the same proportion of the total as in 1913. The active period of exports of dried apples is from October to January. Over three-fourths of the total usually moves during these four months. Shipments correspond in general with the active export season for fresh apples.

### APPLE IMPORTS

Import figures for apples, available in detail only since September, 1922, show imports, September to December, 1922, equivalent to 48,327 barrels, and for the year ended December 31, 1923, to 44,472 barrels. About three-fourths of the arrivals are from Canada and

these are far more than offset by the exports to that country. Barreled Gravensteins from Nova Scotia and standard varieties of boxed apples from British Columbia are a feature, some seasons, in our northeastern markets. Both lines are of excellent general quality and sell high in their respective classes. Of the 897,000 barrels, including boxes computed as barrels, exported from Canada to the United States in the eight years, 1917 to 1923, according to Canadian reports, the general tendency has been toward increase, but the average imports from Canada in barrels and boxes, all reported as barrels, were only the equivalent of 187 cars per year. Miscellaneous imports are from Australia and other countries of the Southern Hemisphere with main shipping seasons in the summer months.

## SUMMARY

In production of apples, the United States is the leading country. Apple consumption may be considered in some sense a measure of national prosperity and well-being. The box-apple product, sometimes about one-half the market supply, represents the highest development of skill and specialized methods applied to this fruit.

The boxed-apple industry is distinct in general location, in the classes of apples and leading varieties grown and in prevailing methods of production, handling, packing, and marketing. Boxed apples in consuming centers are distributed through fairly distinct lines of trade and mainly to special classes of consumers.

The great points of advantage are the heavy and fairly regular annual yields, the large size, high color, good handling quality, and smooth finish of the fruit. These qualities are explained as caused by a favorable climate and skill of the growers.

The six-year average commercial production preceding 1924 was nearly three-fourths that of the barrel region. The western boxed-apple region includes 11 States, but Washington had averaged over half the combined production.

In 1923 the boxed-apple region produced nearly one-half the total commercial apple crop, or about 50,000,000 bushels. Nine-tenths of the boxed-apple crop was in Washington, Oregon, Idaho, and California; about three-fifths in Washington alone.

Washington, Oregon, and Idaho are termed "the Pacific Northwest apple region," and their production, which constitutes the greater part of the boxed winter-apple supplies in eastern markets, is referred to as "northwestern boxed apples," while the more general term is "western boxed apples."

The largest and most highly developed producing sections in the various parts of the boxed-apple region are the Wenatchee, Yakima, Spokane, and Walla Walla districts in Washington; the Hood River and Rogue River districts in Oregon; Payette and Boise Valleys in Idaho; the Watsonville and Sebastopol districts in California; the Grand and Gunnison Valleys in Colorado; the Provo and Tremonton districts in Utah; and the Pecos Valley in New Mexico.

Essentials of apple handling and packing are: (1) To pick at the right time, (2) to handle carefully, (3) to grade uniformly, and (4) to pack properly. The system of sorting, grading, and packing is highly specialized and developed in the northwest. Shipment is largely in refrigerator cars.

Losses from unused cull stock are especially great whenever apple pests and diseases are unusually prevalent or when the weather conditions have interfered with the effectiveness of spraying operations. The supply of culls often exceeds the demand for manufacture of by-products.

Sale by growers to dealers, on contract, has been the popular way of disposal, especially when spot cash accompanies delivery of the fruit. Cooperative selling ranks second, offering greater risks and greater possibilities. Third is commission selling, which places all the risk on the grower but gives him a chance to profit by the dealer's skill and judgment in marketing and by the superior quality of the product.

The cooperative idea is gaining ground in the Northwest. Advantages claimed for association methods include establishment of a reputation for the brand; the economy of buying supplies in large quantities; the saving in the use of the telegraph; efficiency in collecting accounts and in general advertising.

In some city markets the greater part of the supply is handled by the usual classes of wholesale dealers, but auctions sell fully 20 per cent of the total boxed apple shipments, including 25 to 90 per cent of the sales in some of the large market centers.

Red varieties sell better than the green or yellow kinds in most markets. Boxed apples dominate many of the western and southwestern city markets.

The six most important commercial varieties are Winesap, Jonathan, Rome Beauty, Esopus Spitzenburg, Yellow Newtown, and Delicious.

The harvest season extends from the middle of September to the middle of November, but local storage permits shipments to continue throughout the winter, although the bulk of the shipments are made before the first of the year.

Prices of boxed apples in consuming markets are usually higher than for barreled stock, but the increasing supply year by year tends to bring the prices nearer together in full-crop seasons.

Exports of boxed apples have increased from 13,000 boxes in 1895 to over 6,000,000 in the season of 1923-24. A large proportion of the yellow varieties and the medium to small sizes are exported to British markets. Canada, northern Europe, and Latin America receive many shipments. Sale at auction on arrival is the prevailing method of disposal. Imports are of comparatively small volume, chiefly from British Columbia. Direct shipments by water routes to foreign markets may do much to assure profitable disposal of surplus fruit.

TABLE 1.—*Features of the western boxed-apple region*

| State | Average commercial production, 1918 to 1923 | Average car-lot shipments, 1918 to 1923 | Leading varieties | Leading counties | Leading shipping stations | Principal markets | Shipping season |
|---|---|---|---|---|---|---|---|
| | *1,000 boxes* | *1,000 boxes* | | | | | |
| Washington | 21,219 | 20,758 | Winesap, Jonathan, Delicious, Rome Beauty. | Yakima, Chelan, Okanogan, Spokane. | Yakima, Wenatchee, Cashmere, Zillah, Omak, Chelan. | New York, Chicago, Philadelphia, Boston, Pittsburgh. | July to June. |
| California | 4,204 | 3,589 | Yellow Newtown, Yellow Bellflower, Gravenstein. | Santa Cruz, Sonoma. | Watsonville, Sebastopol | Los Angeles, New York, Chicago, Boston, Cleveland. | Do. |
| Oregon | 3,769 | 3,510 | Yellow Newtown, Esopus Spitzenburg. | Hood River, Jackson, Umatilla, Wasco, Union. | Hood River, Medford, Milton, Imbler, Mosier. | New York, Portland, Chicago, Omaha, Los Angeles. | July to May. |
| Idaho | 2,993 | 3,091 | Jonathan, Rome Beauty, Winesap. | Payette, Canyon, Kootenai, Gem. | Payette, Fruitland, Nampa, Emmett, Parma. | Chicago, New York, Kansas City, St. Louis, Omaha. | August to May. |
| Colorado | 2,370 | 2,303 | Winesap, Rome Beauty, Ben Davis group. | Delta, Mesa, Montrose | Paonia, Grand Junction, Austin, Clifton, Hotchkiss. | Chicago, Kansas City, St. Louis. | August to April. |

TABLE 2.—*General methods of disposal by growers*

| Method | Agency | Financed by— | Features | Advantages | Disadvantages | Comment |
|---|---|---|---|---|---|---|
| Cash sales | Local buyers, or agents of eastern buyers. | Local banks, eastern banks. | May sell before or after harvest. | Definite returns, little risk. | Price often lower | Popular when demand is active. |
| Consignment | Commission or consignment houses. | Bank loans to dealers | Dealers often lend to growers. | Chance of higher prices | Risk, delay, uncertainty. | Still much practiced. |
| Direct shipment | City brokers | Personal credit at bank | Owner may hold in storage. | Sometimes lower cost of marketing. | Involves capital and risk. | Available to few growers. |
| Cooperative: | | | | | | |
| Centralized | Local sales manager. | Crop notes, bank loans | Crop pooled and sold in common. | Collective credit, sales facilities and supervision. | Some delay and uncertainty regarding price to be received. | Many variations in western cooperative organizations. |
| Decentralized | Selling agency | Bank loans | Crop pooled for each subassociation. | Grower has some control of marketing agencies. | do | Do. |

TABLE 3.—*Representative boxed-apple cooperatives*

| Associations | Membership, 1923 | Cars shipped in 1922 | Apple sales in 1922 | Sold by— | Organization | Date organized |
|---|---|---|---|---|---|---|
| Apple Growers Assn., Hood River, Oreg | 1,000 | 1,650 | $1,350,469 | Local sales manager | Stock company; mostly grower's 5-year contracts. | 1913 |
| Sebastopol Apple Growers Union, Sebastopol, Calif | 800 | About 700 | 609,268 | do | Stock company | 1911 |
| Skookum Packers Assn., Wenatchee, Wash.[1] | About 1,500 (including 20 locals). | 2,263 | 3,500,000 | Selling agency | Nonstock, nonprofit organization. | 1916 |
| Wenatchee District Cooperative Assn., Wenatchee, Wash.[1] | 600 (including 14 locals) | 1,743 | 1,564,169 | Local sales manager | Nonstock, nonprofit organization. Five-year contracts. | 1921 |
| Wenatchee-Okanogan Cooperative Federation, Wenatchee, Wash.[1] | 12 locals | 1,553 | [2] 1,666,369 | Selling agency | Nonstock, nonprofit organization. | 1922 |
| Yakima Co. Hort. Union, Yakima, Wash | 475 | 1,230 | [3] 2,750,000 | Local sales manager | Stock company | 1903 |
| Yakima Fruit Growers Assn., Yakima, Wash | 550 | 755 | 522,412 | do | do | 1911 |

[1] Federation. [2] Estimated. [3] Sales in 1923

TABLE 4.—*Total production of apples in the United States by six-year averages, 1894 to 1923*

[In thousands—000 omitted]

| Six-year period average | Western boxed-apple region | Barreled-apple region | Total production |
|---|---|---|---|
| | *Bushels* | *Bushels* | *Bushels* |
| 1894–1899 | 7,054 | 166,952 | 174,006 |
| 1900–1905 | 10,912 | 175,636 | 186,548 |
| 1906–1911 | 15,029 | 149,471 | 164,500 |
| 1912–1917 | 27,845 | 176,237 | 204,082 |
| 1918–1923 | 48,379 | 124,943 | 173,322 |

TABLE 5.—*Estimated total production in the western boxed-apple region by States; 1918 to 1923, with comparisons*

[In thousands—000 omitted]

| State | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Average 1918 to 1923 | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Total production | Commercial crop compared with total production |
| | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Per cent* |
| Arizona | 138 | 125 | 80 | 47 | 77 | 128 | 99 | 34 |
| California | 6,560 | 8,200 | 6,000 | 6,500 | 7,850 | 10,500 | 7,602 | 55 |
| Colorado | 2,067 | 3,418 | 2,830 | 3,260 | 4,250 | 3,010 | 3,129 | 76 |
| Idaho | 1,200 | 3,800 | 3,420 | 4,500 | 3,900 | 5,600 | 3,737 | 80 |
| Montana | 792 | 850 | 825 | 975 | 610 | 990 | 840 | 45 |
| Nevada | ---------- | 53 | 36 | 24 | 35 | 56 | ---------- | ---------- |
| New Mexico | 912 | 1,100 | 434 | 483 | 750 | 1,400 | 846 | 64 |
| Oregon | 3,384 | 6,921 | 4,158 | 6,667 | 6,300 | 8,000 | 5,905 | 64 |
| Utah | 786 | 760 | 1,064 | 1,037 | 1,085 | 1,119 | 975 | 58 |
| Washington | 16,491 | 25,295 | 21,502 | 29,062 | 25,775 | 33,000 | 25,188 | 84 |
| Wyoming | ---------- | 30 | 18 | 19 | 40 | 35 | ---------- | ---------- |
| Total | 32,330 | 50,552 | 40,367 | 52,514 | 50,672 | 63,838 | 48,379 | 75 |
| Total barreled-apple region | 137,295 | 91,534 | 183,310 | 46,488 | 152,030 | 139,004 | 124,943 | 41 |
| Total United States | 169,625 | 142,086 | 223,677 | 99,002 | 202,702 | 202,842 | 173,322 | 50 |

TABLE 6.—*Estimated commercial production in the western boxed-apple region by States, 1918 to 1923, with comparisons*

[In thousands—000 omitted]

| State | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Average 1918 to 1923 | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Commercial production | Percentage of total |
| | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | |
| Arizona | 45 | 45 | 30 | 18 | 27 | 42 | 34 | 0.1 |
| California | 3,381 | 3,600 | 3,690 | 4,056 | 4,197 | 6,300 | 4,204 | 11.7 |
| Colorado | 1,581 | 2,484 | 2,208 | 2,436 | 3,102 | 2,409 | 2,370 | 6.6 |
| Idaho | 336 | 3,024 | 2,268 | 4,077 | 3,450 | 4,800 | 2,993 | 8.3 |
| Montana | 225 | 420 | 384 | 525 | 345 | 390 | 381 | 1.1 |
| New Mexico | 351 | 792 | 324 | 369 | 450 | 945 | 538 | 1.5 |
| Oregon | 2,013 | 4,071 | 2,496 | 5,001 | 3,780 | 5,250 | 3,769 | 10.4 |
| Utah | 489 | 363 | 588 | 594 | 594 | 780 | 568 | 1.5 |
| Washington | 12,888 | 21,501 | 17,202 | 24,900 | 22,023 | 28,800 | 21,219 | 58.8 |
| Total | 21,309 | 36,300 | 29,190 | 41,976 | 37,968 | 49,716 | 36,076 | 100.0 |
| | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | |
| Total barreled-apple region[1] | 52,920 | 42,177 | 72,525 | 22,695 | 57,867 | 58,092 | 51,046 | |
| Total United States | 74,229 | 78,477 | 101,715 | 64,671 | 95,835 | 107,808 | 87,122 | |

[1] Barrels estimated as 3 bushels or boxes.

TABLE 7.—*Car-lot shipments of apples from the western boxed-apple region by sources and crop movement seasons, 1918 to 1923*

| State | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Total | Average 1918 to 1923 |
|---|---|---|---|---|---|---|---|---|
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* |
| Arizona | | | 5 | 3 | 14 | 9 | 31 | |
| California | 3,473 | 4,076 | 4,413 | 5,062 | 4,961 | 6,505 | 28,490 | 4,748 |
| Colorado | 1,984 | 3,246 | 3,063 | 3,882 | 3,385 | 2,718 | 18,278 | 3,046 |
| Idaho | 536 | 3,943 | 2,977 | 5,913 | 4,230 | 6,935 | 24,534 | 4,089 |
| Montana | 262 | 498 | 443 | 689 | 351 | 461 | 2,704 | 451 |
| New Mexico | 407 | 981 | 293 | 636 | 445 | 1,368 | 4,130 | 688 |
| Nevada | 4 | 2 | | | | | 6 | |
| Oregon | 2,246 | 5,437 | 3,265 | 6,588 | 3,895 | 6,428 | 27,859 | 4,643 |
| Utah | 441 | 198 | 603 | 740 | 718 | 947 | 3,647 | 608 |
| Washington | 16,232 | 27,023 | 22,213 | 33,355 | 28,291 | 37,633 | 164,747 | 27,458 |
| Wyoming | 6 | 3 | 2 | 3 | | 1 | 15 | |
| Total | 25,591 | 45,407 | 37,277 | 56,871 | 46,290 | 63,005 | 274,441 | 45,740 |
| Barreled-apple region | 44,036 | 41,341 | 78,840 | 32,688 | 67,670 | 75,179 | 339,754 | 56,626 |
| Total car-lot shipments | 69,627 | 86,748 | 116,117 | 89,559 | 113,960 | 138,184 | 614,195 | 102,366 |

TABLE 8.—*Car-lot shipments from the western boxed-apple region, by months, crop movement seasons 1918 to 1923, with comparisons*

| Month | 1918–19 | 1919–20 | 1920–21 | 1921–22 | 1922–23 | 1923–24 | Total 1918 to 1923 | Average 1918 to 1923 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Western box region | Barrel region | Total |
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* |
| June [1] | 6 | 5 | 5 | 10 | 2 | 61 | 89 | 15 | 244 | 259 |
| July | 91 | 313 | 245 | 362 | 246 | 1,375 | 2,632 | 438 | 1,522 | 1,960 |
| August | 657 | 808 | 682 | 1,198 | 1,114 | 1,383 | 5,842 | 973 | 2,614 | 3,587 |
| September | 2,229 | 4,117 | 2,283 | 7,254 | 3,472 | 5,251 | 24,606 | 4,101 | 9,090 | 13,191 |
| October | 9,858 | 16,140 | 13,880 | 22,808 | 12,237 | 21,783 | 96,706 | 16,118 | 20,520 | 36,638 |
| November | 6,384 | 10,824 | 8,796 | 11,874 | 10,327 | 13,653 | 61,858 | 10,310 | 8,970 | 19,280 |
| December | 3,088 | 3,358 | 3,364 | 4,698 | 5,568 | 4,636 | 24,712 | 4,119 | 3,156 | 7,275 |
| January | 1,062 | 3,052 | 1,777 | 2,939 | 5,471 | 4,826 | 19,127 | 3,188 | 2,790 | 5,978 |
| February | 1,233 | 2,454 | 2,235 | 3,038 | 3,845 | 5,067 | 17,872 | 2,979 | 2,757 | 5,736 |
| March | 598 | 2,466 | 1,844 | 1,296 | 2,621 | 2,639 | 11,464 | 1,910 | 2,588 | 4,498 |
| April | 271 | 1,269 | 1,209 | 740 | 938 | 1,273 | 5,700 | 950 | 1,373 | 2,323 |
| May | 91 | 578 | 756 | 534 | 389 | 904 | 3,252 | 542 | 803 | 1,345 |
| June [2] | 23 | 23 | 201 | 120 | 60 | 154 | 581 | 97 | 199 | 296 |
| Total | 25,591 | 45,407 | 37,277 | 56,871 | 46,290 | 63,005 | 274,441 | 45,740 | 56,626 | 102,366 |

[1] New stock. [2] Old stock.

TABLE 9.—*Annual car-lot unloads of apples at 12 cities from the western boxed-apple region, by States of origin, 1918–1923*

NEW YORK

| State | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Total 1918 to 1923 | Average, 1918 to 1923 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Car-lot unloads | Percentage of total |
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | |
| Washington | 2,243 | 2,257 | 2,210 | 3,526 | 3,300 | 4,341 | 17,877 | 2,980 | 65.4 |
| Oregon | 551 | 870 | 1,164 | 949 | 1,090 | 1,100 | 5,724 | 954 | 20.9 |
| California | 124 | 539 | 200 | 293 | 399 | 587 | 2,142 | 357 | 7.8 |
| Idaho | 64 | 187 | 132 | 103 | 132 | 172 | 790 | 132 | 2.9 |
| Montana | 23 | 83 | 124 | 259 | 90 | 196 | 775 | 129 | 2.8 |
| Colorado | 5 | 2 | 20 | 2 | 1 | 2 | 32 | 5 | .1 |
| Utah | 2 | 3 | 1 | 4 | | 1 | 11 | | |
| New Mexico | | 8 | | | | 2 | 10 | | |
| Total | 3,012 | 3,949 | 3,851 | 5,136 | 5,012 | 6,401 | 27,361 | 4,560 | |
| Barreled-apple region | 8,313 | 6,593 | 7,185 | 6,455 | 7,489 | 9,105 | 45,140 | 7,523 | |
| Total car-lot unloads | 11,325 | 10,542 | 11,036 | 11,591 | 12,501 | 15,506 | 72,501 | 12,083 | |

CHICAGO

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 490 | 1,366 | 1,539 | 2,567 | 1,633 | 4,498 | 12,093 | 2,016 | 75.9 |
| Idaho | 69 | 242 | 97 | 311 | 157 | 458 | 1,334 | 222 | 8.4 |
| Oregon | 26 | 83 | 42 | 223 | 173 | 550 | 1,097 | 183 | 6.9 |
| Colorado | 41 | 162 | 82 | 43 | 209 | 133 | 670 | 112 | 4.2 |
| California | 27 | 66 | 39 | 120 | 90 | 161 | 503 | 84 | 3.2 |
| Utah | 16 | 10 | 10 | 23 | 16 | 67 | 142 | 24 | .9 |
| New Mexico | | 22 | 3 | | 3 | 34 | 62 | | |
| Montana | | 2 | 1 | 6 | 2 | 12 | 23 | | |
| Wyoming | 1 | | | 5 | | | 6 | | |
| Total | 670 | 1,953 | 1,813 | 3,298 | 2,283 | 5,913 | 15,930 | 2,655 | |
| Barreled-apple region | 3,865 | 4,093 | 5,287 | 3,149 | 4,251 | 4,438 | 25,083 | 4,181 | |
| Total car-lot unloads | 4,535 | 6,046 | 7,100 | 6,447 | 6,534 | 10,351 | 41,013 | 6,836 | |

TABLE 9.—*Annual car-lot unloads of apples at 12 cities from the western boxed-apple region, by States of origin, 1918–1923*—Continued

PHILADELPHIA

| State | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Total 1918 to 1923 | Average, 1918 to 1923 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Car-lot unloads | Percentage of total |
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | |
| Washington | 139 | 645 | 847 | 1,311 | 987 | 1,199 | 5,128 | 855 | 89.7 |
| Oregon | 3 | 54 | 104 | 52 | 19 | 17 | 249 | 42 | 4.4 |
| California | 2 | 21 | 5 | 65 | 38 | 40 | 171 | 28 | 2.9 |
| Idaho | ------- | 62 | 4 | 65 | 21 | 10 | 162 | ------- | ------- |
| Montana | ------- | ------- | ------- | 3 | ------- | ------- | 3 | ------- | ------- |
| New Mexico | ------- | 3 | ------- | ------- | ------- | ------- | 3 | ------- | ------- |
| Total | 144 | 785 | 960 | 1,496 | 1,065 | 1,266 | 5,716 | 953 | ------- |
| Barreled-apple region | 2,554 | 2,075 | 2,256 | 1,822 | 1,449 | 1,945 | 12,101 | 2,017 | ------- |
| Total car-lot unloads | 2,698 | 2,860 | 3,216 | 3,318 | 2,514 | 3,211 | 17,817 | 2,970 | ------- |

BOSTON [1]

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Washington | ------- | ------- | 517 | 739 | 571 | 852 | 2,679 | 670 | 84.6 |
| California | ------- | ------- | 20 | 35 | 45 | 113 | 213 | 53 | 6.7 |
| Oregon | ------- | ------- | 33 | 65 | 42 | 46 | 186 | 46 | 5.8 |
| Idaho | ------- | ------- | 21 | 18 | 26 | 18 | 83 | 21 | 2.7 |
| Montana | ------- | ------- | 1 | 3 | ------- | ------- | 4 | ------- | ------- |
| Colorado | ------- | ------- | ------- | ------- | ------- | 1 | 1 | ------- | ------- |
| Total | ------- | ------- | 592 | 860 | 684 | 1,030 | 3,166 | 792 | ------- |
| Barreled-apple region | ------- | ------- | 888 | 1,062 | 1,105 | 990 | 4,045 | 1,011 | ------- |
| Total car-lot unloads | ------- | ------- | 1,480 | 1,922 | 1,789 | 2,020 | 7,211 | 1,803 | ------- |

ST. LOUIS

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 162 | 80 | 300 | 803 | 274 | 378 | 1,997 | 333 | 56.5 |
| Idaho | 28 | 62 | 75 | 224 | 85 | 154 | 628 | 105 | 17.8 |
| Colorado | 139 | 79 | 125 | 103 | 25 | 6 | 477 | 80 | 13.6 |
| Oregon | 6 | 17 | 65 | 65 | 25 | 30 | 208 | 35 | 5.9 |
| California | 12 | 24 | 26 | 62 | 6 | 24 | 154 | 26 | 4.4 |
| Utah | 14 | 2 | 14 | 27 | ------- | 10 | 67 | ------- | ------- |
| New Mexico | 1 | ------- | ------- | ------- | ------- | ------- | 1 | ------- | ------- |
| Total | 362 | 264 | 605 | 1,284 | 415 | 602 | 3,532 | 589 | ------- |
| Barreled-apple region | 1,178 | 1,114 | 1,370 | 569 | 1,695 | 2,133 | 8,059 | 1,343 | ------- |
| Total car-lot unloads | 1,540 | 1,378 | 1,975 | 1,853 | 2,110 | 2,735 | 11,591 | 1,932 | ------- |

KANSAS CITY

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 265 | 238 | 239 | 248 | 126 | 536 | 1,652 | 275 | 46.8 |
| Idaho | 23 | 73 | 100 | 250 | 109 | 156 | 711 | 118 | 20.0 |
| Colorado | 40 | 44 | 132 | 169 | 115 | 59 | 559 | 93 | 15.8 |
| Oregon | 11 | 12 | 21 | 81 | 61 | 182 | 368 | 61 | 10.4 |
| Utah | 4 | 1 | 18 | 29 | 12 | 40 | 104 | 17 | 2.9 |
| California | 12 | 12 | 12 | 38 | 1 | 20 | 95 | 16 | 2.7 |
| New Mexico | ------- | 1 | ------- | 25 | ------- | 3 | 29 | ------- | ------- |
| Montana | ------- | ------- | ------- | 5 | ------- | ------- | 5 | ------- | ------- |
| Wyoming | ------- | ------- | ------- | 1 | 1 | ------- | 2 | ------- | ------- |
| Total | 355 | 381 | 522 | 846 | 425 | 996 | 3,525 | 588 | ------- |
| Barreled-apple region | 354 | 291 | 483 | 151 | 349 | 511 | 2,139 | 356 | ------- |
| Total car-lot unloads | 709 | 672 | 1,005 | 997 | 774 | 1,507 | 5,664 | 944 | ------- |

[1] No information available for Boston, 1918 and 1919.

TABLE 9.—*Annual car-lot unloads of apples at 12 cities from the western boxed-apple region, by States of origin, 1918–1923*—Continued

PITTSBURGH

| State | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Total 1918 to 1923 | Average, 1918 to 1923 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Car-lot unloads | Percentage of total |
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | |
| Washington | 450 | 225 | 588 | 541 | 518 | 686 | 3,008 | 501 | 85.3 |
| Idaho | 55 | 32 | 22 | 31 | 44 | 52 | 236 | 39 | 6.6 |
| Oregon | 33 | 20 | 43 | 15 | 20 | 23 | 154 | 26 | 4.4 |
| California | | 16 | 4 | 9 | 16 | 19 | 64 | | |
| Colorado | 8 | 14 | 6 | 23 | 2 | 7 | 60 | | |
| Montana | | 1 | | | | | 1 | | |
| Total | 546 | 308 | 663 | 619 | 600 | 787 | 3,523 | 587 | |
| Barreled-apple region | 2,403 | 1,898 | 2,123 | 2,187 | 2,420 | 2,217 | 13,248 | 2,208 | |
| Total car-lot unloads | 2,949 | 2,206 | 2,786 | 2,806 | 3,020 | 3,004 | 16,771 | 2,795 | |

DETROIT

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 114 | 332 | 373 | 458 | 496 | 623 | 2,396 | 399 | 83.8 |
| Idaho | 12 | 56 | 24 | 38 | 30 | 60 | 220 | 37 | 7.8 |
| Oregon | 2 | 10 | 19 | 8 | 21 | 58 | 118 | 20 | 4.2 |
| California | 1 | 13 | 6 | 11 | 36 | 43 | 110 | 18 | 3.8 |
| Colorado | 1 | 8 | | | | | 9 | | |
| Utah | 1 | | | 2 | | | 3 | | |
| New Mexico | | | 1 | | | | 1 | | |
| Total | 131 | 419 | 423 | 517 | 583 | 784 | 2,857 | 476 | |
| Barreled-apple region | 542 | 1,086 | 536 | 506 | 819 | 998 | 4,487 | 748 | |
| Total car-lot unloads | 673 | 1,505 | 959 | 1,023 | 1,402 | 1,782 | 7,344 | 1,224 | |

CLEVELAND

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 288 | 309 | 407 | 369 | 358 | 531 | 2,262 | 377 | 86.1 |
| Idaho | 4 | 48 | 19 | 22 | 14 | 25 | 132 | 22 | 5.0 |
| California | 3 | 11 | 3 | 3 | 16 | 53 | 89 | 15 | 3.4 |
| Oregon | 3 | 17 | 22 | 23 | 9 | 17 | 91 | 15 | 3.4 |
| Colorado | 5 | 30 | 1 | 5 | 2 | 3 | 46 | 8 | 1.8 |
| Utah | 1 | 1 | | 2 | 1 | | 5 | | |
| New Mexico | | 3 | | | | | 3 | | |
| Wyoming | | | 1 | 1 | | | 2 | | |
| Total | 304 | 419 | 453 | 425 | 400 | 629 | 2,630 | 438 | |
| Barreled-apple region | 888 | 981 | 1,243 | 753 | 1,501 | 1,232 | 6,598 | 1,100 | |
| Total car-lot unloads | 1,192 | 1,400 | 1,696 | 1,178 | 1,901 | 1,861 | 9,228 | 1,538 | |

CINCINNATI

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 167 | 132 | 369 | 414 | 424 | 519 | 2,025 | 338 | 79.3 |
| Idaho | 6 | 61 | | 104 | 25 | 36 | 232 | | |
| Oregon | | 9 | 21 | 45 | 46 | 55 | 176 | | |
| California | 8 | 31 | 16 | 13 | 4 | 8 | 80 | 13 | 3.0 |
| Utah | 4 | 1 | 17 | 10 | | 1 | 33 | | |
| Colorado | | 6 | | 1 | 2 | 1 | 10 | | |
| Montana | | 2 | | | | | 2 | | |
| New Mexico | | | | | | 2 | 2 | | |
| Total | 185 | 242 | 423 | 587 | 501 | 622 | 2,560 | 426 | |
| Barreled-apple region | 943 | 1,206 | 1,193 | 1,216 | 755 | 1,033 | 6,346 | 1,058 | |
| Total car-lot unloads | 1,128 | 1,448 | 1,616 | 1,803 | 1,256 | 1,655 | 8,906 | 1,484 | |

TABLE 9.—*Annual car-lot unloads of apples at 12 cities from the western boxed-apple region, by States of origin, 1918–1923*—Continued

MINNEAPOLIS

| State | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Total 1918 to 1923 | Average, 1918 to 1923 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Car-lot unloads | Percentage of total |
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | |
| Washington | 160 | 145 | 228 | 329 | 294 | 401 | 1,557 | 260 | 92.8 |
| Idaho | | 3 | | 10 | 9 | 51 | 73 | | |
| Colorado | 10 | 4 | 1 | | 1 | 1 | 17 | | |
| Oregon | 4 | 1 | | 2 | | 12 | 19 | | |
| Montana | | 1 | | 10 | | | 11 | | |
| California | 1 | 1 | | 1 | | 2 | 5 | | |
| Utah | 1 | | | 1 | | 3 | 5 | | |
| Total | 176 | 155 | 229 | 353 | 304 | 470 | 1,687 | 281 | |
| Barreled-apple region | 392 | 192 | 234 | 65 | 401 | 211 | 1,495 | 249 | |
| Total car-load unloads | 568 | 347 | 463 | 418 | 705 | 681 | 3,182 | 530 | |

ST. PAUL

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Washington | 211 | 142 | 201 | 289 | 272 | 310 | 1,425 | 238 | 92.6 |
| Idaho | 5 | 5 | 8 | 16 | 9 | 37 | 80 | 13 | 5.1 |
| Oregon | 2 | 2 | 4 | 3 | 1 | 5 | 17 | 3 | 1.2 |
| Montana | 2 | 1 | | 4 | 3 | | 10 | | |
| Colorado | | 3 | | | 4 | 1 | 8 | | |
| Utah | | | | | | 1 | 1 | | |
| Total | 220 | 153 | 213 | 312 | 289 | 354 | 1,541 | 257 | |
| Barrelled-apple region | 190 | 74 | 188 | 37 | 204 | 74 | 767 | 128 | |
| Total car-load unloads | 410 | 227 | 401 | 349 | 493 | 428 | 2,308 | 385 | |

TOTAL FOR 12 CITIES

| Region | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Total 1918 to 1923 | Average |
|---|---|---|---|---|---|---|---|---|
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* |
| Western boxed-apple region [1] | 6,105 | 9,028 | 10,747 | 15,733 | 12,561 | 19,854 | 74,028 | 12,338 |
| Barreled-apple region [1] | 21,622 | 19,603 | 22,986 | 17,972 | 22,438 | 24,887 | 129,508 | 21,585 |
| Total car-lot unloads [1] | 27,727 | 28,631 | 33,733 | 33,705 | 34,999 | 44,741 | 203,536 | 33,923 |

[1] No information available for Boston, 1918 and 1919.

TABLE 10.—*Car-lot unloads of apples from the western boxed-apple region at 29 cities, by States of origin, June 1, 1923, to May 31, 1924*

| State | Atlanta | Birmingham | Boston | Buffalo | Chicago | Cincinnati | Cleveland | Columbus | Dallas | Denver |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* |
| California | 11 | 43 | 112 | 15 | 160 | 8 | 52 | 6 | 33 | 24 |
| Colorado | | 2 | 1 | | 131 | 1 | | 1 | 25 | 375 |
| Idaho | 3 | 17 | 21 | 5 | 459 | 37 | 22 | 15 | 82 | 107 |
| Montana | | | | | 13 | | | | | |
| New Mexico | | 2 | | | 34 | 2 | | | 73 | 9 |
| Nevada | | | | | | | | | | |
| Oregon | 15 | 22 | 42 | 12 | 521 | 26 | 17 | 18 | 8 | 17 |
| Utah | | | | | 67 | 1 | | | 4 | 21 |
| Washington | 189 | 286 | 810 | 147 | 4,070 | 633 | 587 | 146 | 287 | 121 |
| Total | 218 | 372 | 986 | 179 | 5,455 | 708 | 678 | 186 | 512 | 674 |
| Barreled-apple region | 336 | 314 | 1,051 | 281 | 4,302 | 1,182 | 1,087 | 245 | 25 | |
| Total both regions | 554 | 686 | 2,037 | 460 | 9,757 | 1,890 | 1,765 | 431 | 537 | 674 |

| State | Detroit | Indianapolis | Kansas City | Los Angeles | Louisville | Memphis | Milwaukee | Minneapolis | Newark | New Orleans |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* |
| California | 43 | 6 | 20 | 1,796 | 6 | 40 | 13 | 2 | 4 | 43 |
| Colorado | | 1 | 46 | | 3 | 11 | 2 | 1 | | 29 |
| Idaho | 72 | 76 | 168 | 32 | 89 | 16 | 82 | 55 | 1 | 51 |
| Montana | | | | | 2 | | 5 | | | |
| New Mexico | | | 3 | | | 10 | | | | 28 |
| Nevada | | 1 | | | | | | | | |
| Oregon | 20 | 31 | 178 | 104 | 21 | 13 | 26 | 12 | 29 | 18 |
| Utah | | | 38 | 430 | | 2 | 1 | 3 | | 1 |
| Washington | 611 | 141 | 486 | 388 | 177 | 177 | 403 | 405 | 126 | 249 |
| Total | 746 | 256 | 939 | 2,750 | 298 | 269 | 532 | 478 | 160 | 419 |
| Barreled-apple region | 1,026 | 409 | 510 | | 777 | 556 | 689 | 252 | 557 | 217 |
| Total both regions | 1,772 | 665 | 1,449 | 2,750 | 1,075 | 825 | 1,221 | 730 | 717 | 636 |

| State | New York | Omaha | Philadelphia | Pittsburgh | Portland | Providence | St. Louis | St. Paul | Washington | Total 29 cities |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* | *Cars* |
| California | 504 | 9 | 35 | 20 | 7 | | 23 | | 10 | 3,045 |
| Colorado | 2 | 39 | | 7 | | | 4 | 1 | | 682 |
| Idaho | 220 | 124 | 6 | 47 | | 13 | 130 | 38 | | 1,988 |
| Montana | 263 | 2 | | | | | | | | 285 |
| New Mexico | 2 | 1 | | | | | 3 | | | 167 |
| Nevada | | | | | | | | | | 1 |
| Oregon | 1,334 | 115 | 14 | 22 | 246 | 4 | 19 | 5 | 16 | 2,925 |
| Utah | 1 | 12 | | | | | 10 | 1 | | 592 |
| Washington | 5,021 | 328 | 1,288 | 569 | 145 | 68 | 384 | 307 | 180 | 18,729 |
| Total | 7,347 | 630 | 1,343 | 665 | 398 | 85 | 573 | 352 | 206 | 28,414 |
| Barreled-apple region | 9,179 | 95 | 2,033 | 2,122 | | 370 | 2,022 | 107 | 498 | 30,242 |
| Total both regions | 16,526 | 725 | 3,376 | 2,787 | 398 | 455 | 2,595 | 459 | 704 | 58,656 |

TABLE 11.—*Average estimated total and commercial production of the western boxed-apple region, total car-lot shipments and unloads at 12 cities,*[1] *by States, average of seasons 1918 to 1923*

| State | Average of seasons 1918 to 1923 | | | | | |
|---|---|---|---|---|---|---|
| | Estimated production | | Percentage of total crop that is commercial | Shipments | Percentage of commercial crop shipped in car lots | Unloads at 12 cities |
| | Total | Commercial | | | | |
| | *1,000 boxes* | *1,000 boxes* | | *Cars* | | *Cars* |
| Arizona | 99 | 34 | 34 | | | |
| California | 7,602 | 4,204 | 55 | 4,748 | 85 | 617 |
| Colorado | 3,129 | 2,370 | 76 | 3,046 | 97 | 297 |
| Idaho | 3,737 | 2,993 | 80 | 4,089 | [2] 103 | 804 |
| Montana | 840 | 381 | 45 | 451 | 89 | 154 |
| New Mexico | 846 | 538 | 64 | 688 | 97 | 17 |
| Oregon | 5,905 | 3,769 | 64 | 4,643 | 93 | 1,469 |
| Utah | 975 | 568 | 58 | 608 | 81 | 60 |
| Washington | 25,188 | 21,219 | 84 | 27,458 | 98 | 9,825 |
| Total | 48,379 | 36,076 | 75 | 45,740 | 96 | 13,244 |
| Barreled-apple region | 124,943 | 51,046 | 41 | 56,626 | 58 | 22,223 |
| Grand total | 173,322 | 87,122 | 50 | 102,366 | 74 | 35,467 |

[1] New York, Chicago, Philadelphia, Boston, St. Louis, Kansas City, Pittsburgh, Detroit, Cleveland, Cincinnati, Minneapolis, and St. Paul.
[2] Excess of shipments over commercial crop to be explained partially by short crop in eastern region, which caused shipment of much stock from the West not originally considered commercial.

TABLE 12.—*Estimated total and commercial production of the western boxed-apple region, total car-lot shipments and unloads at 12 cities,*[1] *seasons 1918–19 to 1923–24*

| Season | Production | | Percentage of total crop that is commercial | Shipments | Percentage of commercial crop shipped in car lots | Unload at 12 cities |
|---|---|---|---|---|---|---|
| | Total | Commercial | | | | |
| | *1,000 bushels* | *1,000 boxes* | | *Cars* | | *Cars* |
| 1918–19 | 32,330 | 21,309 | 66 | 25,591 | 91 | [2] 5,761 |
| 1919–20 | 50,552 | 36,300 | 72 | 45,407 | 95 | [2] 12,935 |
| 1920–21 | 40,367 | 29,190 | 72 | 37,277 | 97 | [2] 9,419 |
| 1921–22 | 52,514 | 41,976 | 80 | 56,871 | [3] 102 | 17,167 |
| 1922–23 | 50,672 | 37,968 | 75 | 46,290 | 92 | 13,910 |
| 1923–24 | 63,838 | 49,716 | 78 | 63,005 | 96 | 20,272 |
| Average 1918–23 | 48,379 | 36,076 | 75 | 45,740 | 96 | 13,244 |
| | | *1,000 bushels* | | | | |
| Average barreled-apple region | 124,943 | 51,046 | 41 | 56,626 | 58 | 22,223 |
| Average both regions | 173,322 | 87,122 | 50 | 102,366 | 74 | 35,467 |

[1] See footnote 1, Table 11.
[2] Boston 1918 and 1919 and St. Louis 1920 estimated.
[3] Excess of shipments over commercial crop to be explained partially by short crop in eastern region, which caused shipment of much stock from the West not originally considered commercial.

TABLE 13.—*Car-lot unloads of apples at 12 cities, average 1918 to 1923,*[1] *compared with 1920 population of city market districts, including incorporated units within 10 miles*

| City | Population market districts, 1920 | | | Average unloads, calendar years 1918 to 1923 [1] | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | Percentage of— | | From western box region | Total both regions | Total as bushels | Percentage of total supply | Per capita |
| | | Total for 12 cities | United States urban | | | | | |
| | | | | *Cars* | *Cars* | *Bushels* | | *Bushels* |
| New York | 8,034,349 | 37.0 | 14.8 | 4,560 | 12,083 | 7,396,935 | 35.1 | 0.9 |
| Chicago | 3,201,301 | 14.8 | 5.9 | 2,655 | 6,836 | 4,202,205 | 20.0 | 1.3 |
| Philadelphia | 2,428,728 | 11.2 | 4.5 | 953 | 2,970 | 1,779,393 | 8.4 | .7 |
| Boston | 1,801,320 | 8.3 | 3.3 | 792 | 1,803 | 1,129,527 | 5.4 | .6 |
| Pittsburgh | 1,216,464 | 5.6 | 2.2 | 587 | 2,795 | 1,602,972 | 7.6 | 1.3 |
| Detroit | 1,181,057 | 5.5 | 2.2 | 476 | 1,224 | 752,556 | 3.6 | .6 |
| St. Louis | 1,014,457 | 4.7 | 1.9 | 589 | 1,932 | 1,150,359 | 5.5 | 1.1 |
| Cleveland | 951,579 | 4.4 | 1.7 | 438 | 1,538 | 908,628 | 4.3 | 1.0 |
| Cincinnati | 681,287 | 3.1 | 1.3 | 427 | 1,484 | 878,262 | 4.2 | 1.3 |
| Minneapolis and St. Paul | 679,864 | 3.1 | 1.2 | 538 | 915 | 604,653 | 2.9 | .9 |
| Kansas City | 502,242 | 2.3 | .9 | 588 | 944 | 631,428 | 3.0 | 1.3 |
| Total | 21,692,648 | 100.0 | 39.9 | 12,603 | 34,524 | 21,036,918 | 100.0 | [2] 1.0 |

[1] Boston, average 1920–1923. [2] Average.

TABLE 14.—*Cold storage holdings of boxed apples October 1, 1918, to June 1, 1924, with comparisons*

(In thousands—000 omitted.)

| Season | Oct. 1 | Nov. 1 | Dec. 1 | Jan. 1 | Feb. 1 | Mar. 1 | Apr. 1 | May 1 | June 1 |
|---|---|---|---|---|---|---|---|---|---|
| Boxed stock: | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* |
| 1918–19 | | 2,513 | 4,945 | 5,137 | 4,205 | 2,431 | 1,410 | 545 | 170 |
| 1919–20 | 440 | 4,244 | 7,793 | 8,508 | 7,296 | 5,331 | 2,982 | 1,598 | 447 |
| 1920–21 | 277 | 2,878 | 6,651 | 7,259 | 6,266 | 4,890 | 3,548 | 2,009 | 826 |
| 1921–22 | 667 | 5,464 | 11,281 | 11,061 | 8,667 | 6,282 | 4,107 | 2,088 | 721 |
| 1922–23 | 699 | 4,164 | 7,271 | 8,319 | 7,612 | 5,593 | 3,343 | 1,475 | 380 |
| 1923–24 | 789 | 6,886 | 13,866 | 14,201 | 11,550 | 8,821 | 5,837 | 2,901 | 949 |
| Average | 574 | 4,358 | 8,634 | 9,081 | 7,599 | 5,558 | 3,538 | 1,769 | 582 |
| | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Bushels* |
| Barreled stock [1] | 2,238 | 10,056 | 11,475 | 9,825 | 7,533 | 5,199 | 2,952 | 1,431 | 489 |
| Combined average | 2,812 | 14,414 | 29,109 | 18,906 | 15,132 | 10,757 | 6,490 | 3,200 | 1,071 |

[1] All apples, excepting those packed in western-style boxes of 1 bushel, are tabulated in terms of barrels on the basis of 3 bushels to the barrel.

TABLE 15.—*Boxed apples in storage, in principal States, averaged by months, 1920 to 1922*

(In thousands—000 omitted)

| State | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* | *Boxes* |
| Alabama | 43 | 40 | 33 | 25 | 16 | 8 | | | | 2 | 14 | 43 |
| Arkansas | 27 | 21 | 15 | 8 | 2 | | | | 1 | 12 | 14 | 42 |
| California | 1,310 | 1,100 | 826 | 509 | 274 | 102 | 28 | 11 | 14 | 312 | 1,040 | 1,466 |
| Colorado | 127 | 90 | 62 | 35 | 19 | 8 | 3 | | | 3 | 62 | 108 |
| District of Columbia | 53 | 40 | 28 | 21 | 11 | 4 | 2 | | | | 15 | 45 |
| Georgia | 38 | 39 | 31 | 21 | 12 | 3 | 1 | | | 10 | 40 | 61 |
| Idaho | 44 | 56 | 35 | 11 | 3 | | | | | | 25 | 68 |
| Illinois | 1,200 | 935 | 626 | 385 | 224 | 83 | 14 | 8 | 10 | 16 | 362 | 991 |
| Iowa | 122 | 97 | 62 | 44 | 19 | 5 | 2 | | | 3 | 43 | 104 |
| Indiana | 168 | 142 | 96 | 168 | 28 | 8 | 1 | | | 7 | 55 | 143 |
| Kansas | 143 | 118 | 75 | 41 | 52 | 6 | 1 | | 2 | 13 | 66 | 133 |
| Kentucky | 32 | 28 | 21 | 18 | 11 | 6 | 2 | | 1 | 3 | 21 | 44 |
| Louisiana | 71 | 59 | 44 | 34 | 22 | 13 | 4 | 1 | 2 | 2 | 27 | 56 |
| Maryland | 22 | 13 | 9 | 8 | 4 | 2 | 1 | | | 2 | 19 | 27 |
| Massachusetts | 140 | 119 | 88 | 65 | 44 | 16 | 3 | | | 3 | 36 | 96 |
| Michigan | 106 | 84 | 59 | 34 | 14 | 8 | 2 | | | 4 | 58 | 98 |
| Minnesota | 398 | 236 | 177 | 112 | 63 | 27 | 7 | 2 | 2 | 5 | 96 | 279 |
| Missouri | 499 | 386 | 277 | 282 | 300 | 37 | 7 | 2 | 2 | 12 | 194 | 284 |
| Nebraska | 216 | 157 | 103 | 75 | 40 | 9 | 2 | | 1 | 1 | 97 | 208 |
| New Jersey | 407 | 295 | 217 | 128 | 57 | 33 | 12 | 2 | 5 | 15 | 120 | 341 |
| New York | 970 | 902 | 752 | 458 | 225 | 79 | 12 | 4 | 3 | 15 | 142 | 532 |
| Ohio | 172 | 136 | 95 | 68 | 33 | 24 | 10 | 3 | 4 | 5 | 67 | 152 |
| Oklahoma | 125 | 104 | 67 | 26 | 10 | 1 | | | 1 | 1 | 25 | 122 |
| Oregon | 319 | 240 | 179 | 85 | 34 | 2 | 1 | | 1 | 21 | 262 | 357 |
| Pennsylvania | 288 | 200 | 140 | 267 | 34 | 15 | 4 | 1 | 1 | 10 | 102 | 234 |
| Tennessee | 73 | 60 | 43 | 28 | 20 | 7 | 2 | 2 | 1 | 5 | 30 | 72 |
| Texas | 212 | 185 | 118 | 296 | 68 | 29 | 9 | 4 | 14 | 7 | 99 | 199 |
| Virginia | 153 | 139 | 111 | | | | | | | | | |
| Washington | 1,472 | 1,251 | 1,012 | 728 | 403 | 82 | 8 | 1 | | 44 | 898 | 1,689 |
| West Virginia | 22 | 18 | 14 | 8 | 4 | 2 | | | | 4 | 25 | 28 |
| Wisconsin | 62 | 48 | 38 | 27 | 21 | 11 | 4 | | 1 | 2 | 29 | 59 |

TABLE 16.—*Market characteristics of boxed-apple varieties*

| Variety | Leading source (boxed) | Main market season | Size | Color | Use | Price compared with Jonathan | Comments |
|---|---|---|---|---|---|---|---|
| Arkansas Black | Washington, Oregon. | November to May. | Rather large | Dark red | Cooking | Considerably lower. | Showy appearance, good keeper and shipper, poor quality. |
| Arkansas (Mammoth Black Twig) | do | do | do | Deep red | Good for baking | About same | Ordinary quality. |
| Ben Davis | Washington, Colorado. | do | Medium to large. | Mixed red | Cooking | Considerably lower. | Long keeper, poor eating quality, popular in southern markets. |
| Delicious | Washington, Idaho. | October to April | do | Bright red | Table | Tops the market | Distinctive in shape and quality, one of the best sellers. |
| Esopus Spitzenburg | Washington, Oregon. | October to February. | do | Red | do | Little higher | High color and quality. |
| Gano | Colorado, Washington. | November to May. | do | Dull red | Cooking | Considerably lower. | Long keeper, poor eating quality, popular in southern markets. |
| Gravenstein | California | July to September. | Medium | Yellow with red stripes. | Mostly table | About same | Early and of high quality, earliest good boxed apple. |
| Grimes Golden | Washington, Colorado. | October to December. | Small to medium. | Yellow | do | Sometimes higher | Of high quality and light color, popular in a few markets. |
| Jonathan | Washington, Colorado, Idaho. | October to February. | do | Red | Table and general | | Well known, and of fine quality, popular in season. |
| King David | Washington | October to November. | do | do | General | Sometimes higher | Good appearance, only fair quality, early fall apple. |
| McIntosh | Montana, Washington. | October to December. | do | Bright red | Table | Generally higher | Good appearance and quality, short keeper, favorite in some eastern markets. |
| Ortley | Oregon | November to March. | Medium | Yellow | Dessert | About same | Fruit tender and of high quality. |
| Rome Beauty | Washington, Idaho, California | November to May. | Medium to large. | Medium red | Mostly cooking | Mostly lower | Good size and finish, large sizes popular, poor quality. |
| Stayman Winesap | Washington, Oregon. | November to January. | do | Dull red | General | Often lower | Good general quality, gaining favor. |
| White Pearmain | Washington | December to March. | Medium | Yellow | do | Sometimes lower | Good quality, not well known. |
| Winesap | Washington, Idaho. | January to May | Small to medium. | Dark red | do | Higher | General utility, keeps well, leads late market. |
| Winter Banana | Washington, Oregon, Idaho. | October to December. | do | Yellow and red. | Table and general | Sometimes higher | Good appearance; poor keeper and quality fair. |
| Yellow Belleflower | California | November to December. | do | Yellow | do | Often lower | Season and market limited. |
| Yellow Newtown | Oregon, Washington, California. | January to May | do | Yellow or green. | Table and baking | Variable | Fine quality, favored for export trade. |

TABLE 17.—*Prices to jobbers of northwestern Extra Fancy Winesap apples in boxes, by months, seasons 1918 to 1924*

| Year and month | New York | Boston | Philadelphia | Pittsburgh | Chicago | Kansas City |
|---|---|---|---|---|---|---|
| 1918–19 | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| November | 3. 25 | 2. 75–3. 25 | | 2. 50–2. 75 | | 3. 25–3. 50 |
| December | 2. 75–3. 00 | 2. 75–3. 25 | 2. 90–3. 00 | 2. 90–3. 15 | 2. 65–3. 00 | 3. 00–3. 25 |
| January | 3. 00–3. 50 | 3. 00–3. 25 | | 3. 00–3. 25 | 2. 75–3. 50 | 3. 25 |
| February | 3. 75–4. 25 | 3. 50–4. 00 | 4. 00–4. 50 | 3. 25–4. 00 | 3. 25–4. 00 | 3. 25–4. 00 |
| March | 4. 00–4. 50 | 4. 00–4. 50 | 4. 25–4. 75 | 4. 00–4. 50 | 3. 75–4. 50 | 4. 50–4. 75 |
| 1919–20 | | | | | | |
| December | 3. 25–3. 50 | | 2. 75–3. 25 | [1] 1. 80–2. 50 | [1] 1. 90–2. 75 | |
| January | 3. 00–3. 50 | 3. 50 | 2. 75–3. 00 | [1] 2. 05–2. 90 | [1] 2. 35–3. 00 | |
| February | 3. 00–3. 50 | | 3. 25–3. 50 | 3. 00–3. 50 | 3. 00–3. 25 | 3. 00–3. 50 |
| March | 3. 50–4. 25 | 4. 00–4. 25 | 3. 75–4. 25 | 3. 50–4. 00 | 3. 25–3. 75 | 3. 50–4. 00 |
| April | 4. 00–5. 00 | 3. 50–4. 00 | 3. 50–4. 00 | 3. 50–4. 25 | 3. 50–3. 75 | 3. 75–4. 00 |
| May | 4. 50–5. 00 | 4. 00–5. 00 | 4. 75–5. 25 | 4. 50–5. 25 | 3. 50–4. 25 | 3. 50–3. 75 |
| 1920–21 | | | | | | |
| December | 2. 25–4. 00 | 2. 75–3. 25 | 2. 50–3. 25 | 2. 75–3. 00 | 2. 50–3. 50 | |
| January | 3. 00–4. 25 | 3. 00–3. 50 | 2. 65–3. 00 | | [1] 2. 50–3. 50 | |
| February | 3. 50–4. 50 | 3. 50–4. 50 | 3. 50–4. 50 | 3. 00–3. 75 | 3. 00–3. 50 | 3. 50–4. 00 |
| March | 3. 00–5. 00 | 3. 00–5. 00 | 2. 75–4. 00 | 2. 50–3. 75 | 2. 75–3. 75 | 3. 50–4. 00 |
| April | 3. 25–5. 00 | 2. 50–4. 00 | 2. 25–4. 00 | 2. 25–3. 75 | 2. 25–3. 75 | 3. 50–4. 00 |
| May | 2. 50–4. 75 | 2. 25–4. 00 | 2. 75–4. 00 | 2. 50–3. 75 | 2. 75–4. 00 | 3. 50–4. 00 |
| 1921–22 | | | | | | |
| December | 2. 65–2. 75 | 2. 25–2. 35 | 2. 55–2. 75 | | | |
| January | 2. 75–3. 00 | 3. 00–3. 50 | 2. 35–2. 95 | | 2. 25–3. 00 | |
| February | 3. 50–3. 75 | 2. 20–3. 95 | 3. 15–3. 35 | 3. 00–3. 50 | 2. 75–3. 50 | 3. 50 |
| March | 3. 50–4. 00 | 3. 00–4. 00 | 3. 00–3. 50 | 3. 00–3. 50 | 3. 00–3. 50 | 3. 50–3. 75 |
| April | 2. 75–4. 00 | | 3. 00–3. 50 | 2. 75–3. 25 | 3. 00–3. 50 | 3. 25–3. 75 |
| May | 3. 25–4. 25 | 2. 25–3. 50 | 3. 00–3. 50 | 2. 50–3. 50 | 3. 00–3. 25 | 3. 00–3. 50 |
| 1922–23 | | | | | | |
| January | 2. 00–2. 75 | | | 2. 25–2. 50 | 2. 25–2. 75 | |
| February | 2. 00–2. 50 | 2. 00–2. 75 | 2. 25–2. 75 | 1. 85–2. 50 | 2. 25–2. 50 | |
| March | 2. 00–2. 75 | 2. 25–2. 75 | 2. 25–2. 75 | 2. 00–2. 75 | 2. 25–2. 65 | 2. 50 |
| April | 2. 75–3. 25 | 2. 25–2. 75 | 2. 15–3. 00 | 2. 25–3. 00 | 2. 50–2. 75 | 2. 75 |
| May | 3. 50–4. 00 | 2. 75–3. 00 | 2. 50–3. 50 | 2. 50–3. 00 | 2. 50–3. 00 | 2. 75–3. 00 |
| 1923–24 | | | | | | |
| January | 2. 00–2. 75 | 2. 00–2. 25 | 1. 85–2. 50 | 1. 75–2. 00 | 2. 25–2. 50 | |
| February | 1. 90–2. 35 | 2. 10–2. 25 | 1. 75–2. 25 | 2. 00–2. 25 | 2. 00–2. 50 | |
| March | 1. 90–2. 75 | 2. 00–2. 25 | 1. 75–2. 35 | 2. 00–2. 25 | 2. 25–2. 50 | 2. 40 |
| April | 2. 00–2. 40 | 2. 25 | 2. 00–2. 50 | 2. 00–2. 25 | 2. 25–2. 50 | 2. 40 |
| May | 2. 25–2. 50 | 2. 00–2. 25 | 1. 75–2. 40 | 2. 00–2. 75 | 2. 25–2. 35 | 2. 40–2. 50 |
| June | 2. 65–3. 25 | 3. 00–3. 10 | 2. 40–3. 50 | 2. 75–3. 25 | 2. 50–3. 50 | 2. 40–2. 65 |
| 1924–25 | | | | | | |
| December | 2. 75–3. 50 | [1] 2. 85–3. 50 | 2. 75–2. 90 | [1] 2. 25–2. 65 | 3. 25–3. 50 | |
| January | 3. 00–3. 50 | [1] 3. 25–3. 85 | 3. 00–3. 50 | 3. 50–3. 75 | 3. 25–3. 75 | 3. 25–3. 75 |
| February | 3. 25–3. 85 | [1] 2. 85–4. 35 | 2. 75–3. 65 | 3. 25–3. 65 | 3. 50–3. 75 | 3. 75 |
| March | 3. 25–3. 75 | 3. 00–3. 50 | 3. 00–3. 50 | 3. 25–3. 75 | 3. 75 | 3. 75 |
| April | 3. 50–4. 50 | 3. 50–3. 75 | 3. 50–4. 00 | 3. 50–3. 75 | 3. 50–3. 75 | 3. 75 |

[1] Auction prices.

TABLE 18.—*Prices to jobbers of northwestern Extra Fancy Jonathan apples in boxes, by months, seasons 1918 to 1924*

| Year and month | New York | Boston | Philadelphia | Pittsburgh | Chicago | Kansas City |
|---|---|---|---|---|---|---|
| | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| 1918–19 | | | | | | |
| October | 3.00–4.00 | 3.00–4.50 | [1] 2.25–2.90 | 3.00–3.50 | [1] 2.25–3.50 | 3.00–4.00 |
| November | 2.60–3.50 | 2.75–3.25 | [1] 2.00–3.00 | 2.75–3.25 | [1] 1.80–3.50 | 2.75–3.50 |
| December | | | [1] 2.15–2.30 | 2.50–3.25 | 2.75–3.35 | 3.25–3.50 |
| 1919–20 | | | | | | |
| October | 3.25–4.00 | 3.00–4.00 | [1] 2.85–3.50 | 2.75–3.50 | [1] 2.40–3.50 | 3.25–3.50 |
| November | 3.00–3.25 | 3.00–3.50 | [1] 2.40–3.20 | 2.50–3.00 | [1] 2.20–3.35 | 3.00–3.65 |
| December | 2.75–3.25 | 3.00–3.40 | [1] 2.27–3.10 | 2.10–3.00 | 2.75–3.25 | 2.75–3.25 |
| January | 2.75–3.25 | | 3.00–3.25 | 2.30–3.25 | 2.75–3.25 | 2.75–3.00 |
| February | 3.25–3.75 | 3.00–3.50 | 2.25–3.50 | 3.00–3.50 | 2.75–3.25 | 2.75–3.25 |
| 1920–21 | | | | | | |
| October | 3.00–5.25 | 3.00–5.00 | 2.00–3.50 | 2.65–4.25 | [1] 2.85–4.10 | 3.50–3.75 |
| November | 2.75–3.25 | 2.75–4.00 | 2.50–3.00 | 2.25–3.00 | 3.00–3.25 | 3.25–3.50 |
| December | 2.50–4.00 | | | 2.25–3.25 | 2.25–3.00 | 2.75–3.25 |
| January | 2.25–2.50 | | | 2.05–3.00 | 2.00–3.00 | |
| 1921–22 | | | | | | |
| October | 2.25–3.75 | 2.50–3.75 | 2.50–3.50 | 2.50–3.50 | 2.25–3.00 | 3.00–3.25 |
| November | 2.25–2.40 | 2.50–3.00 | 2.00–2.60 | 2.25–2.75 | 2.00–3.00 | 2.75–3.10 |
| December | 2.25–2.65 | 2.75 | 2.00–2.50 | 1.75–2.75 | 2.25–3.00 | 3.00 |
| January | 2.25–2.50 | | | 2.00–3.00 | 2.00–3.00 | |
| 1922–23 | | | | | | |
| October | 2.50–3.75 | 2.25–3.00 | 1.75–3.50 | 2.00–2.75 | 2.25–3.00 | 2.50 |
| November | 1.75–2.25 | 1.75–2.50 | 1.50–2.40 | 2.00–2.50 | 2.00–2.50 | 2.25–2.50 |
| December | 1.75–2.00 | 1.70–2.25 | 1.50–2.10 | 1.50–2.00 | 2.00–2.50 | 2.25–2.50 |
| January | 1.75–2.00 | | 1.85 | | 2.00–2.50 | 2.25–2.50 |
| February | 2.10–2.50 | | 2.00 | | 2.25–2.50 | 2.25–2.50 |
| 1923–24 | | | | | | |
| October | 1.50–2.75 | 1.75–2.25 | 1.50–2.25 | 1.75–3.00 | 2.00–2.50 | 1.75–2.75 |
| November | 1.50–2.25 | 1.75–2.00 | 1.50–2.00 | 1.75–2.00 | 2.00–2.25 | 2.00–2.25 |
| December | 1.50–2.25 | | 1.75–2.20 | 1.75–2.25 | 2.00–2.50 | 2.00–2.25 |
| January | 1.50–1.90 | | | | 2.00–2.25 | 2.25–2.50 |
| 1924–25 | | | | | | |
| October | 2.25–3.25 | 3.00 | 2.00–3.25 | 2.25–3.50 | 2.85–3.25 | 2.50–3.00 |
| November | 2.50–3.15 | 2.75 | 2.25–2.90 | 2.50–2.75 | 3.00–3.35 | 3.00 |
| December | 2.25–2.75 | 2.35–3.00 | | 2.75–3.00 | 3.00–3.50 | |
| January | 2.25–3.00 | | | | 3.00–3.75 | |

[1] Auction prices.

TABLE 19.—*Weekly prices per box of American apples on British markets (London and Liverpool), seasons 1922 and 1923*

| Week ended— | Yellow Newtown | Spitzenburg | Jonathan | Grimes Golden and Delicious [1] | King David and Winesap [2] | Rome Beauty |
|---|---|---|---|---|---|---|
| 1922–23 | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* | *Dollars* |
| Oct. 21 | 2. 96–3. 52 | | 3. 35–3. 57 | | 1. 69–1. 92 | |
| Oct. 28 | 2. 11–3. 56 | | 2. 11–3. 44 | | 2. 44–3. 11 | |
| Nov. 4 | 1. 56–3. 79 | | 2. 34–3. 12 | | 1. 86–2. 19 | |
| Nov. 11 | 2. 45–3. 12 | | 1. 78–2. 79 | | 1. 70–2. 20 | |
| Nov. 18 | 2. 13–3. 36 | 1. 93–2. 15 | 1. 96–2. 69 | 1. 65–2. 13 | 1. 90–2. 13 | 2. 13–2. 90 |
| Nov. 25 | 2. 25–3. 37 | 2. 02–2. 25 | 1. 57–2. 30 | 1. 70–2. 29 | 2. 02–2. 19 | 1. 90–2. 43 |
| Dec. 2 | 2. 49–3. 28 | 1. 92–2. 09 | 1. 70–2. 26 | 2. 15–2. 30 | 1. 93–2. 13 | 1. 70–2. 15 |
| Dec. 9 | 2. 63–3. 65 | 2. 05–3. 02 | 1. 26–2. 51 | 1. 69–2. 38 | 2. 05–2. 51 | 1. 91–2. 67 |
| Dec. 16 | 2. 49–3. 71 | 1. 97–2. 44 | 1. 51–2. 32 | 1. 74–2. 44 | 1. 86–2. 38 | 2. 00–2. 59 |
| Dec. 23 | 2. 44–3. 08 | 1. 80–3. 02 | 1. 28–3. 02 | 1. 97–2. 55 | 1. 74–2. 44 | 1. 51–2. 25 |
| Jan. 6 | 2. 32–3. 02 | 1. 86–2. 91 | 1. 74–2. 15 | 1. 63–2. 44 | 1. 74–2. 85 | 2. 15–2. 44 |
| Jan. 13 | 1. 87–2. 92 | 2. 10–2. 80 | 1. 87–2. 46 | 1. 70–2. 25 | 1. 75–2. 90 | 2. 20–2. 50 |
| Jan. 20 | 1. 75–3. 09 | 1. 98–2. 91 | 1. 40–2. 68 | 1. 86–3. 03 | 1. 98–3. 15 | 2. 33–2. 68 |
| Jan. 27 | 1. 70–2. 89 | 1. 91–2. 90 | 2. 33–2. 80 | 2. 19–3. 00 | 1. 97–3. 12 | 2. 16–2. 68 |
| Feb. 3 | 1. 69–2. 57 | 1. 87–2. 98 | 2. 30–2. 91 | 1. 93–2. 59 | 1. 87–2. 98 | 2. 20–2. 70 |
| 1923–24 | | | | | | |
| Oct. 2 | 2. 50–4. 77 | 3. 01–3. 41 | 3. 35–3. 52 | [3] 3. 41–3. 75 | [3] 3. 41–3. 63 | |
| Oct. 9 | 2. 50–4. 15 | 3. 64–4. 10 | 2. 50–2. 96 | 3. 50–3. 80 | 1. 59–2. 16 | |
| Oct. 16 | 2. 21–3. 97 | 2. 84–3. 20 | 2. 04–3. 97 | 3. 63–3. 86 | 2. 27–3. 69 | |
| Oct. 23 | 1. 68–3. 42 | 2. 00–3. 00 | 1. 34–3. 36 | 2. 95–3. 29 | 1. 62–2. 91 | |
| Oct. 30 | 1. 57–2. 41 | 1. 79–2. 35 | 1. 91–2. 58 | 1. 79–2. 07 | 1. 91–2. 35 | |
| Nov. 6 | 1. 67–2. 57 | 1. 79–2. 00 | 1. 56–2. 23 | 1. 56–1. 79 | 1. 34–1. 56 | |
| Nov. 13 | 1. 64–2. 63 | 1. 75–2. 00 | 1. 53–2. 00 | 1. 31–1. 75 | 1. 31–1. 42 | |
| Nov. 20 | 1. 73–2. 28 | 1. 52–1. 73 | 1. 30–2. 17 | 1. 30–1. 73 | 1. 52–1. 84 | |
| Nov. 27 | 1. 53–2. 73 | 1. 53–1. 97 | 1. 42–2. 02 | 1. 31–1. 53 | 1. 53–1. 64 | |
| Dec. 4 | 1. 79–2. 60 | 1. 75–2. 39 | 1. 30–2. 17 | 1. 30–1. 79 | 1. 74–1. 96 | |
| Dec. 11 | 2. 00–2. 59 | 1. 65–1. 97 | 1. 37–2. 25 | 1. 15–1. 87 | 1. 70–1. 83 | |
| Dec. 18 | 1. 87–3. 02 | 1. 95–2. 40 | 1. 65–2. 59 | 1. 43–1. 87 | 1. 65–1. 89 | |
| Dec. 25 | 1. 52–2. 39 | 1. 63–2. 17 | 1. 74–2. 39 | 1. 85–2. 33 | 1. 68–2. 55 | 1. 85–2. 23 |
| Jan. 1 | 1. 88–2. 57 | 1. 82–2. 36 | 1. 93–2. 57 | 1. 72–2. 20 | 2. 25–2. 52 | 1. 77–2. 14 |
| Jan. 8 | 1. 50–2. 57 | 2. 04–2. 36 | 2. 04–2. 73 | 1. 93–2. 36 | 1. 93–3. 00 | 1. 88–2. 14 |
| Jan. 15 | 2. 39–2. 97 | 2. 39–2. 49 | 2. 76–3. 66 | 2. 33–3. 18 | 2. 33–3. 02 | 1. 70–2. 23 |
| Jan. 22 | 2. 43–2. 96 | 2. 32–2. 54 | 2. 43–3. 65 | 2. 32–3. 43 | 2. 54–3. 01 | 1. 69–2. 27 |
| Jan. 29 | 2. 13–2. 98 | 2. 34–2. 82 | 2. 56–2. 93 | 2. 24–3. 30 | 2. 08–3. 09 | 1. 73–2. 49 |
| Feb. 5 | 2. 64–2. 91 | 2. 58–3. 23 | 2. 58–3. 01 | 2. 21–2. 50 | 2. 80–3. 01 | 2. 53–2. 58 |
| Feb. 12 | 2. 37–3. 50 | 2. 58–3. 12 | 2. 37–2. 93 | 2. 37–2. 78 | 2. 37–3. 12 | 2. 53–3. 17 |
| Feb. 19 | 2. 57–3. 11 | 2. 36–3. 00 | 2. 68–3. 38 | | 2. 79–3. 16 | 2. 57–3. 11 |
| Feb. 26 | 2. 37–3. 23 | 2. 58–3. 23 | 2. 37–3. 23 | | 2. 80–3. 39 | |
| Mar. 4 | 2. 79–3. 60 | 2. 36–3. 11 | | | 2. 58–3. 33 | |
| Mar. 11 | 2. 72–3. 31 | 2. 56–2. 99 | | | 2. 35–3. 26 | |
| Mar. 18 | 2. 57–3. 43 | 2. 36–3. 06 | | | 2. 14–3. 16 | |
| Mar. 25 | 2. 63–2. 95 | 2. 42–2. 68 | | | 2. 36–2. 79 | |
| Apr. 1 | 1. 94–2. 69 | 2. 15–2. 58 | | | 2. 20–2. 37 | |
| Apr. 8 | 1. 89–3. 14 | 2. 38–2. 49 | | | 1. 84–2. 76 | 2. 49–2. 71 |

[1] Quotations on Grimes Golden up to and including Dec. 23. Quotations on Delicious Dec. 23 to end of season.

[2] Quotations on King David up to and including Nov. 18. Quotations on Winesap from Nov. 25 to end of season.

[3] Quotations on Grimes Golden and King David up to and including Dec. 18. Quotations on Delicious and Winesap Dec. 25 to end of season.

TABLE 20.—*Features of boxed-apple export trade*

| Country | Exported from United States July, 1922, to June, 1923, inclusive | Leading apple ports | Freight and refrigeration [1] per box from New York, 1922–23 | Tariff per 100 pounds, February, 1924 | Varieties preferred | Usual sales method | Special features |
|---|---|---|---|---|---|---|---|
| | *Boxes* | | *Cents* | *Cents* | | | |
| United Kingdom | 2,503,633 | London, Liverpool, Glasgow. | 50 | None. | Yellow Newtown, Baldwin, Rome Beauty, Winesap, York Imperial, Jonathan. | Commission. | Sales mostly at auction. |
| Canada | 347,919 | By rail | | [2] 96 | Standard red | F. o. b. | |
| Norway | 128,537 | Oslo | [1] 60 | 45 | do | Contract through agents. | Prompt delivery important. |
| Germany | 14,483 | Hamburg | 60 | [3] None. | do | Commission. | Large sales at auction. |
| Mexico | 103,824 | Tampico | 112½ | 45 | do | Wire orders. | |
| Cuba | 49,973 | Havana | 63 | 28 | Winesap and other standard red. | | |
| Argentina | 60,777 | Buenos Aires | 133 | None. | Standard red | Wire orders. | Some shipments on commission. |

[1] No refrigeration service to Scandinavian ports direct. Refrigeration adds 20 cents to regular rate to England, Germany, Holland, and Belgium.
[2] Per barrel.
[3] Tariff in 1926 about 33 cents per box, the rate applicable to imports from the United States.

TABLE 21.—*Exports of apples from the United States, by countries, 1918–19 to 1923–24*

(Three boxes reckoned as one barrel)

| Country | Year beginning July 1 | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Average 1918–1923 |
| | *Barrels* | *Barrels* | *Barrels* | *Barrels* | *Barrels* | *Barrels* | *Barrels* |
| United Kingdom | 1,016,945 | 600,578 | 2,061,622 | 771,452 | 1,314,981 | 2,955,395 | 1,453,496 |
| Germany | | 55 | 1,498 | 75 | 4,846 | 201,446 | 34,653 |
| France | 2,125 | 634 | 445 | 149 | 444 | 465 | 710 |
| Sweden | 32,732 | 14,273 | 13,039 | 13,936 | 9,598 | 138,526 | 37,017 |
| Norway | 116,791 | 76,382 | 74,960 | 47,017 | 56,107 | 88,865 | 76,687 |
| Denmark | 31,455 | 15,105 | 21,576 | 16,893 | 7,330 | 65,841 | 26,367 |
| Other Europe | 2,173 | 2,389 | 4,981 | 2,852 | 2,500 | 96,915 | 18,635 |
| Canada | 264,665 | 188,543 | 327,561 | 133,050 | 162,978 | 260,731 | 222,921 |
| Mexico | 33,442 | 25,676 | 46,500 | 29,653 | 39,022 | 43,823 | 36,353 |
| Australia | | 13 | 3,755 | | 1 | 234 | 667 |
| Cuba | 26,936 | 28,151 | 40,233 | 23,978 | 36,814 | 53,012 | 34,854 |
| Brazil | 11,718 | 23,557 | 13,247 | 9,534 | 14,785 | 28,413 | 16,876 |
| Argentina | 6,576 | 28,336 | 14,907 | 9,257 | 33,342 | 55,699 | 24,686 |
| Other countries | 30,790 | 46,906 | 40,777 | 36,313 | 73,581 | 108,942 | 56,218 |
| Total | 1,576,348 | 1,050,598 | 2,665,101 | 1,094,159 | 1,756,329 | 4,098,307 | 2,040,140 |

TABLE 22.—*Exports of apples from the United States, by months, 1918–19 to 1923–24*

(Three boxes reckoned as one barrel)

| Month | Year beginning July 1 | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 | Average 1918–1923 |
| | *Barrels* | *Barrels* | *Barrels* | *Barrels* | *Barrels* | *Barrels* | *Barrels* |
| July | 22,654 | 23,450 | 15,764 | 8,906 | 34,054 | 34,488 | 23,219 |
| August | 22,517 | 21,659 | 24,037 | 19,639 | 57,006 | 85,461 | 38,386 |
| September | 14,942 | 34,619 | 46,675 | 22,504 | 131,233 | 248,834 | 83,135 |
| October | 90,780 | 115,715 | 217,368 | 129,124 | 254,078 | 948,301 | 292,561 |
| November | 104,572 | 213,270 | 491,786 | 200,052 | 361,375 | 688,800 | 343,309 |
| December | 160,035 | 142,806 | 503,002 | 189,530 | 286,275 | 320,570 | 267,036 |
| January | 213,107 | 161,157 | 591,926 | 157,336 | 217,806 | 447,494 | 298,138 |
| February | 493,996 | 89,115 | 381,411 | 152,338 | 220,644 | 487,288 | 304,132 |
| March | 286,979 | 125,710 | 289,405 | 133,315 | 121,140 | 529,240 | 247,632 |
| April | 137,409 | 73,674 | 73,686 | 59,342 | 59,069 | 248,484 | 108,611 |
| May | 20,747 | 44,113 | 19,248 | 13,816 | 10,177 | 47,738 | 25,973 |
| June | 8,610 | 5,310 | 10,793 | 8,257 | 3,472 | 11,609 | 8,008 |
| Total | 1,576,348 | 1,050,598 | 2,665,101 | 1,094,159 | 1,756,329 | 4,098,307 | 2,040,140 |

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